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WATER SUPPLY & SANITARY IMPROVEMENT

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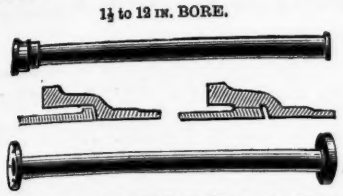

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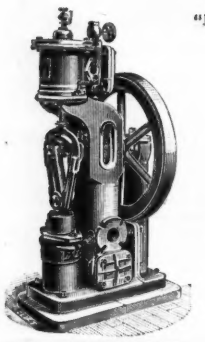

Fig. 703. "SINGLE RAM" STEAM-PUMP.

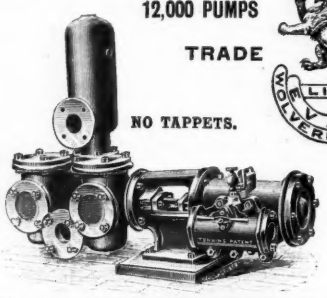

Fig. 598. "CORNISH" STEAM-PUMP FOR BOILER FEEDING, &c.

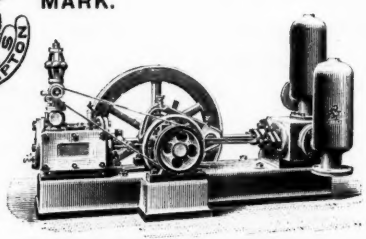

Fig. 685. "RELIABLE" STEAM-PUMP FOR TAR AND THICK FLUIDS.

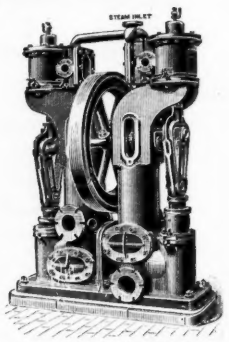

Fig. 712. "DOUBLE-RAM" STEAM-PUMP.

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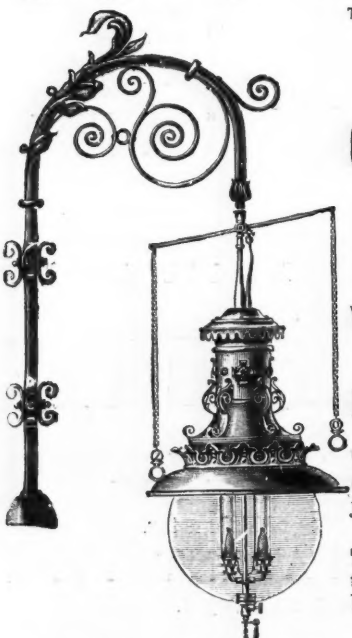

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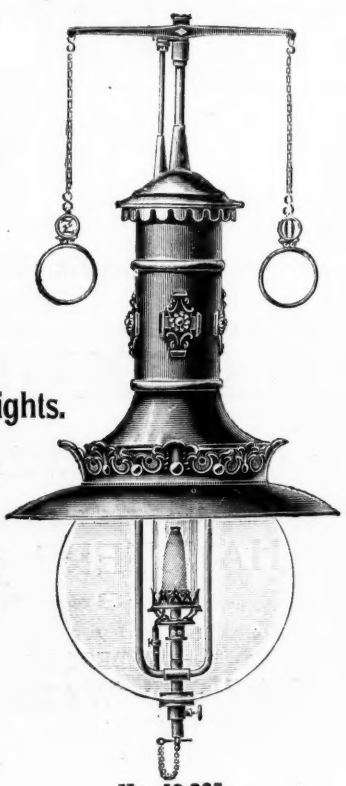

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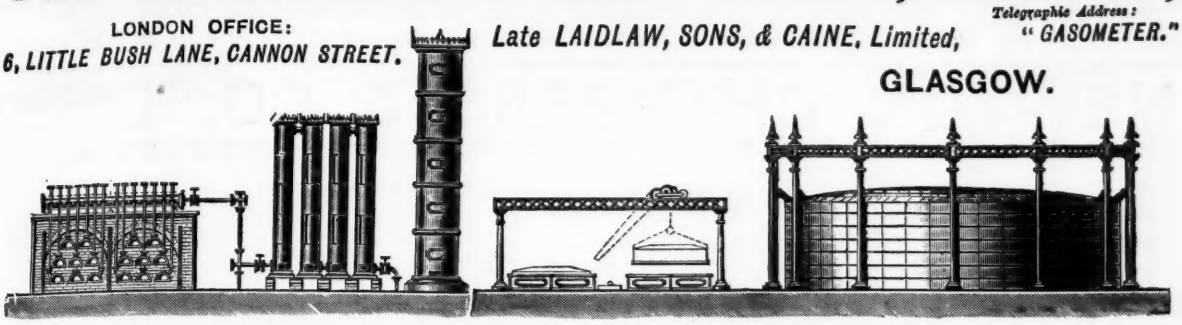

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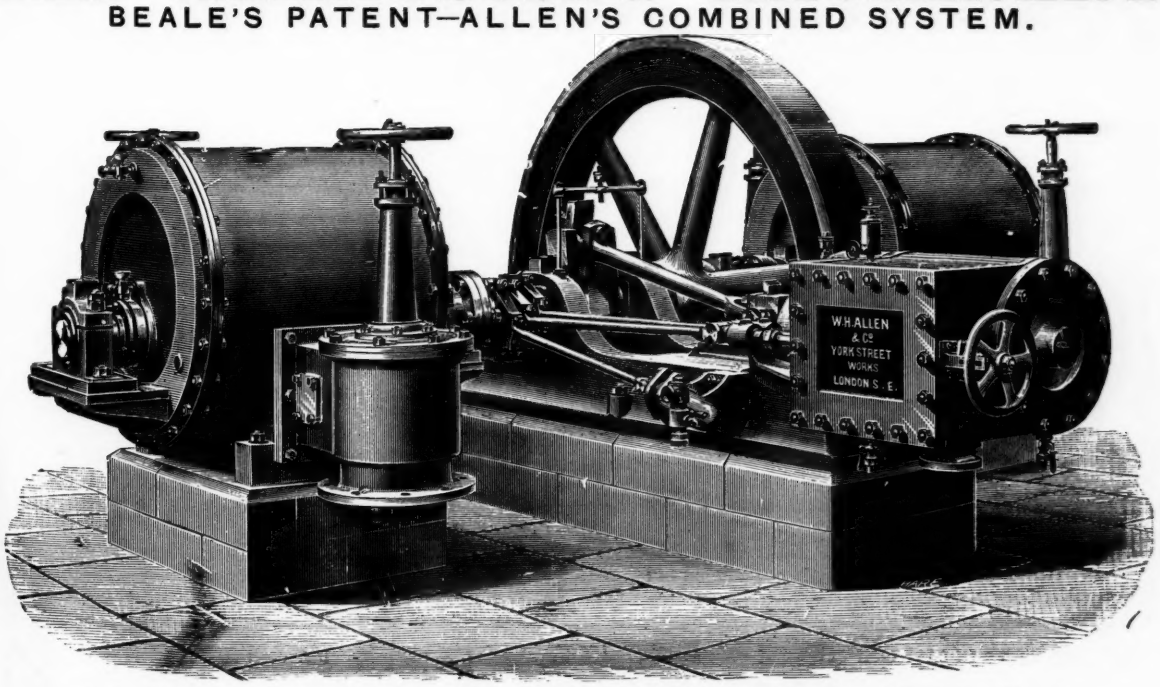

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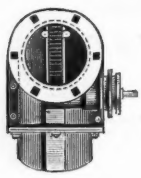

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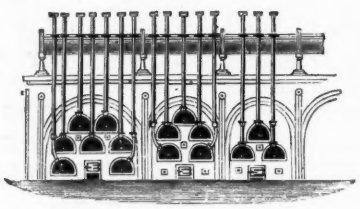

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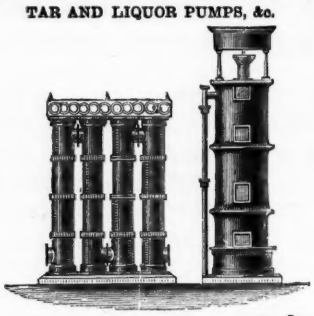

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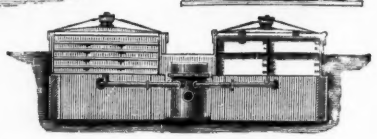

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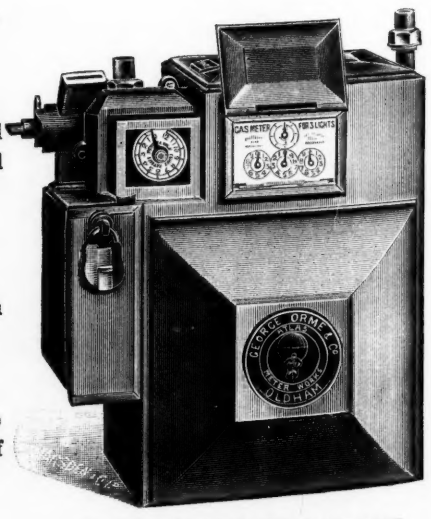

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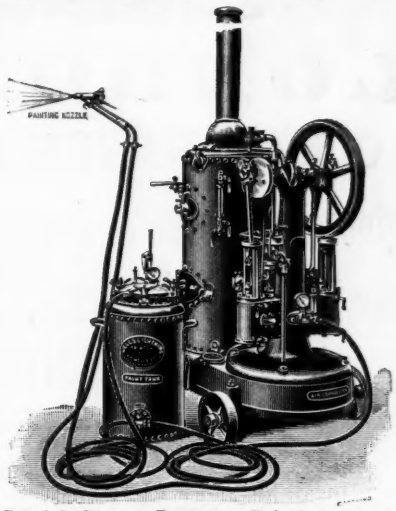

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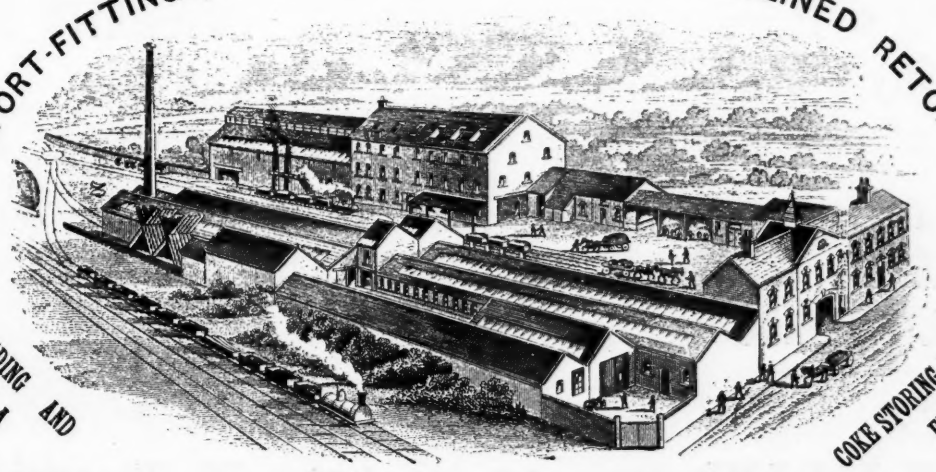

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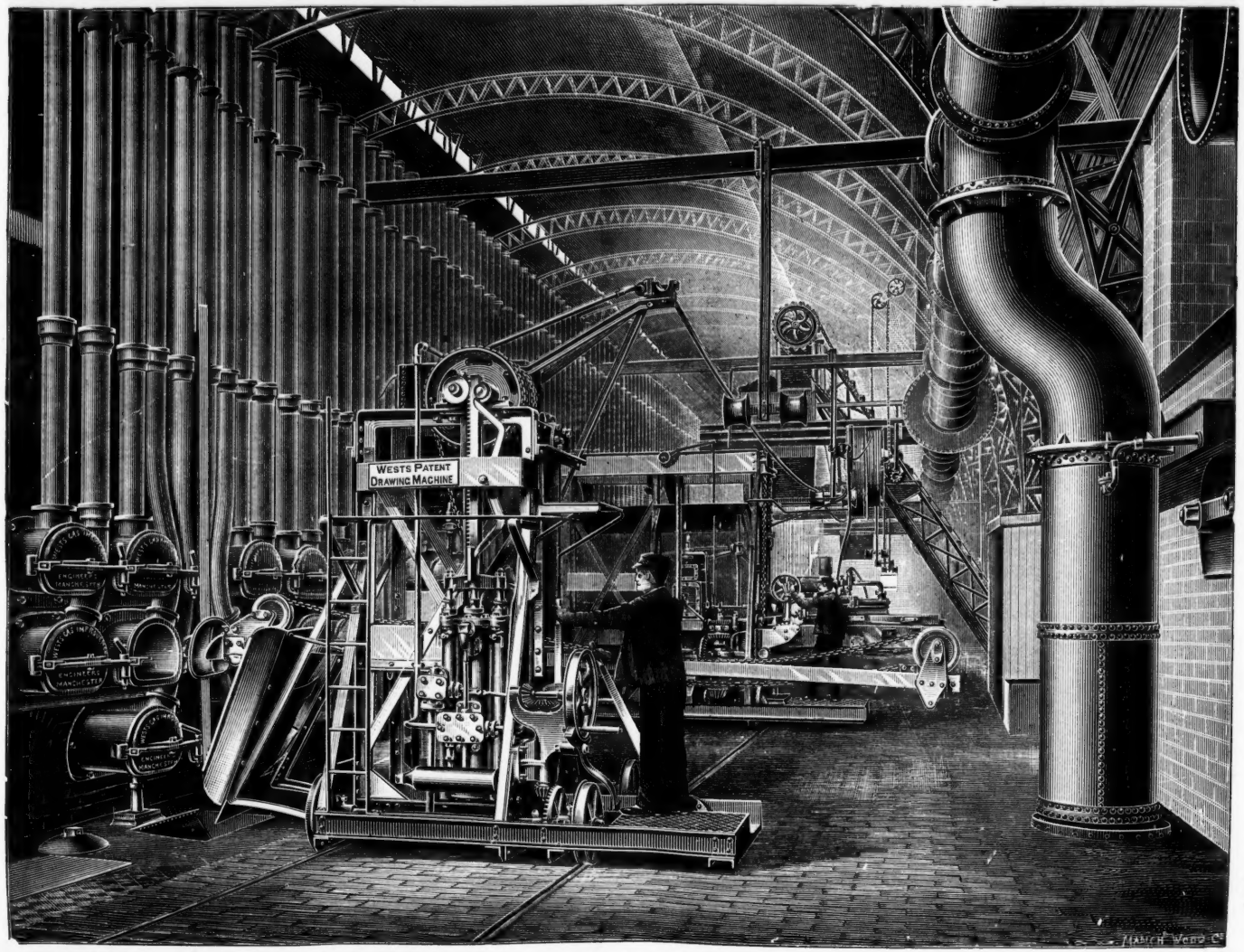

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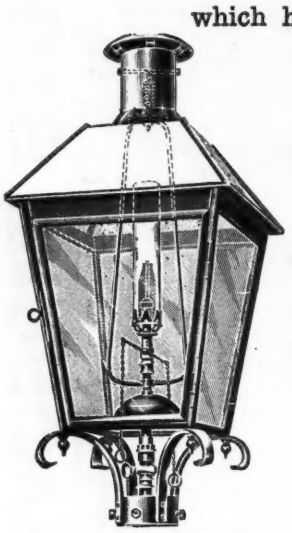

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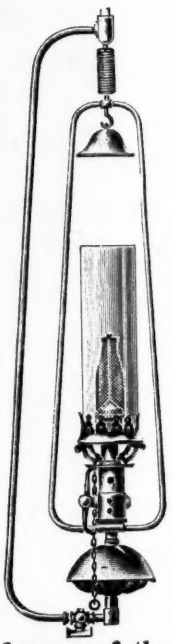

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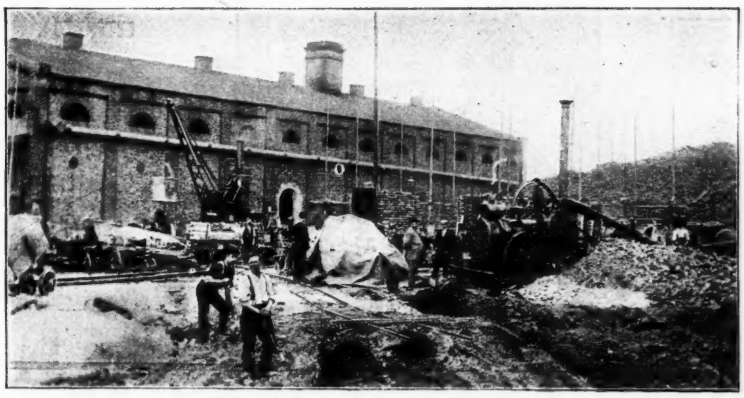

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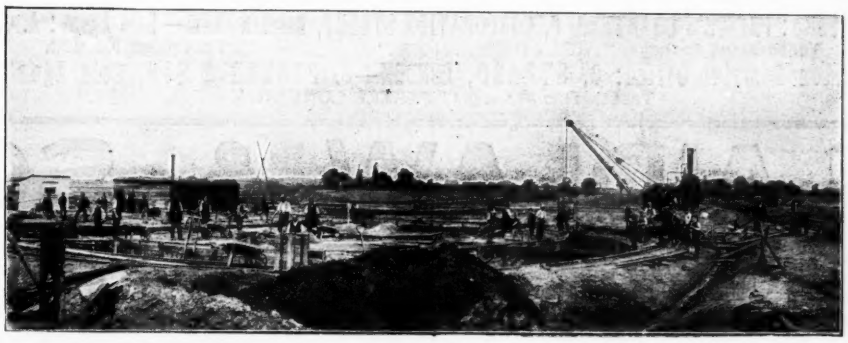

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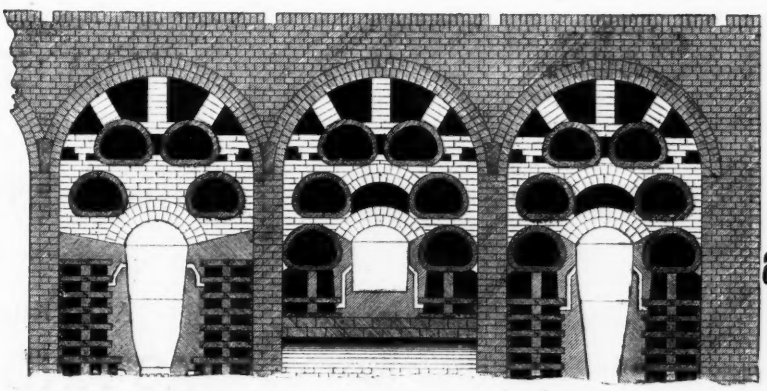

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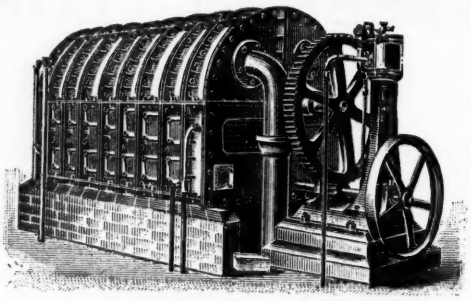

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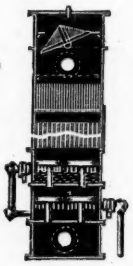

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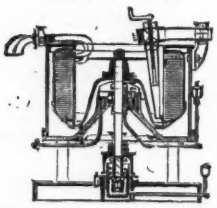

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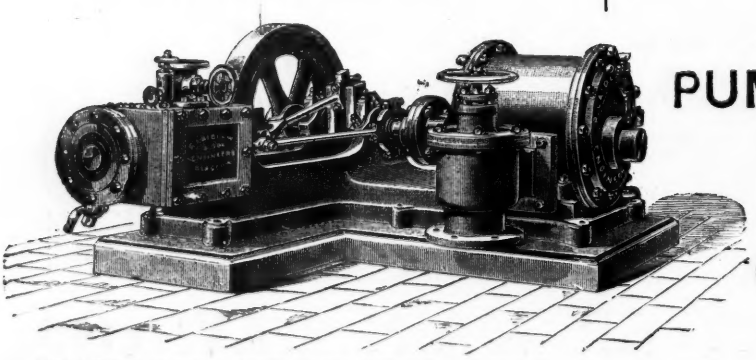

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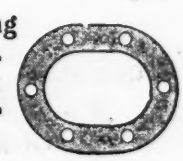

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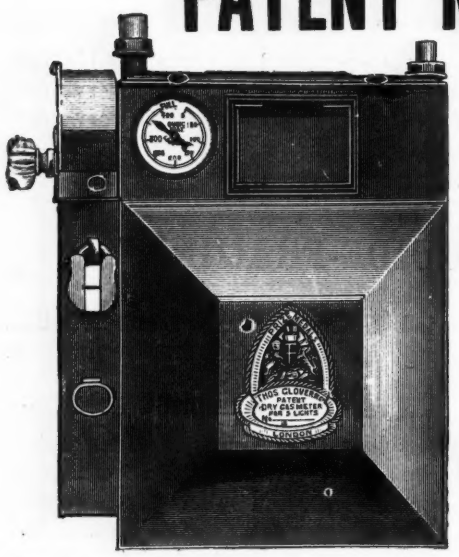

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TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion must be authenticated by the name and address of the writer; not necessarily for publication, but as a proof of good faith.

EDITORIAL NOTES.

The Coze Patent Victorious.

THE case of *The Automatic Coal-Gas Retort Company v. The Corporation of Salford*, the first part of which was mentioned and recorded in the "JOURNAL" last week, ended somewhat suddenly on Tuesday, with a sweeping judgment for the Company on all points. The completeness of their victory will be appreciated from the report of the termination of the action given in our "Legal Intelligence" to-day. It is difficult to recall now the state of expert opinion as to the strength of the Coze patent right which prevailed before the case came into Court. The Company had been notoriously in low water for some time previously to their joining issue with Salford; and some persons accordingly succeeded in persuading themselves that the inclined retort monopoly, such as it was, could be violated with impunity. This was a mean view to take; and it is a good thing for inventors at large that the customary process of stealing the ideas of a patentee who is not deemed strong enough to defend his property has received a check in this instance. We do not say that the Corporation of Salford wished to defraud M. Coze or his assignees of the credit or the reward that might be theirs; but others interested in the late conflict were perhaps not so well-intentioned. It may be freely admitted that the Corporation, at any rate, were not devoid of justification for the stand they made against the claim preferred in the name of M. Coze for the monopoly of the inclined retort. They had adopted the retort upon its merits; but they held that it was not to M. Coze that the establishment of these merits was due. They took the point, in short, that the original Coze arrangement was a failure, and that success in the working of the idea was entirely due to certain subsequent modifications introduced by later workers in this line. For this view, there was a good deal to be said; and it was said at the trial with as much fairness as ability by defendants' Counsel and witnesses.

It is an undoubted fact that, save perhaps at Rheims, the original Coze arrangement is not now in use. It is another fact that for the carbonizing of English coals it is expedient that the inclined retorts should be set at a steeper angle with the horizon than that named by Coze; and this involves a modification of the method of charging. All this, however, does not, in the opinion of the Court, destroy the right of Coze to be regarded as the true and original inventor of the system of carbonizing coal, for the purpose of gas making, in retorts inclined approximately at the angle of repose of the carbonized material, and charged from a coal-hopper by means of a bent charging mouth forming a prolongation of the retort. The defendants in the action apparently did not perceive at first that the plaintiffs intended to rest their case upon the original Coze patent specification and drawings as they stand. The first development of the defence, which came in the course of the cross-examination of the first witness for the plaintiffs, seemed to be confined to several petty points which could not be driven against the broad, strong opening of the plaintiffs' case. And as the action began, so it continued. The alleged anticipations—mostly upon paper—failed to impress the Judge; and the result was a foregone conclusion from the moment when the leading Counsel for the defence allowed it to be seen that he had no better case than that which had already been disclosed in the cross-examination of the witnesses who were called on the other side.

It must always be difficult to draw a clear distinction between an invention which is all the better for being improved, and one that is destroyed by the process. In this instance, the Court has held, and held in the strongest possible terms, that the Coze system belongs to the former category. We congratulate the victors, and hope they will know how to make a proper use of their triumph. This will not be to throw Mr. Justice Romer's judgment at the head of everybody who might think of trying inclined retorts. In the legal sense, the Coze patent is as safe now as it is possible to make it; but the commercial success of the system has not been all that could have been desired. If it is permitted us to say so, we should be disposed to advise the Automatic Coal-Gas Retort Company to be as merciful to possible customers as they

are strong. They can be as hard as they like upon infringers and pirates. But what they want is more trade; and this can only be obtained by good management and liberal dealing. There is a splendid prospect before the system of coal carbonizing in inclined retorts—of this we are sure; but it by no means necessarily follows that the present Company will reap the benefit of it. M. Coze is to be congratulated on the recognition that has been accorded by the English Court of Chancery of his merits as the true inventor of one of the most notable improvements in gas manufacture realized in modern times; and it is to be hoped his reward will not be limited to a mere judicial declaration. This consideration, however, opens up another line of speculation that cannot be gone into now.

Judges as Witnesses on the Companies Bill.

THERE is a certain fascination in the idea of a Judge appearing in the capacity of a witness, and more especially as an expert witness, that heightens the interest felt in the evidence tendered yesterday week to the Lords Committee on the Companies Bill by Lord Justice Lindley and Mr. Justice Romer. Joint-stock company law is of more or less moment to everybody in these days, and few will deny that there is room for the improvement of the statutory regulation of limited liability trading. Lord Justice Lindley entertains strong views regarding the qualification of directors. He wishes to make the qualification real, which is not an easy thing to do. The Act of 1862 does not touch qualification; and this is how directors have escaped responsibility. The new Bill proposes to fine directors who are not properly qualified; but Lord Justice Lindley would merely make them liable to pay the nominal amount of their qualification shares. With regard to the framing of prospectuses, the Lord Justice does not approve of the proposal of the Bill to render the parties to the issue of these documents responsible for the inclusion of all the details as to the dates, parties, and short purport of the effect of every material contract and material fact. This provision he thinks too minute for practical working, and likely to throw the door open to a large amount of vexatious litigation. Lord Justice Lindley is also of opinion that it is a very important question as to what extent floating charges and charges on uncalled capital should be allowed. He states that the ordinary mode of forming a company has altered entirely since he was at the Bar. Now the vendors take debentures for their payment, which makes them the masters of the situation. The moment there is trouble, the debentures are brought in, and unsecured creditors are left out in the cold. This his Lordship called a "frightful "abuse." So likewise with mortgages on unpaid capital. Some interesting colloquy passed between the witness and the Committee concerning the responsibility of directors for the efficient discharge of their official duties. The Bill contains a clause which says that every director shall be under an obligation to use reasonable care and prudence, and shall be liable to compensate the company for any damage incurred by reason of neglect to use such care and prudence; and this theoretically is the actual law at present. Lord Justice Lindley was fain to confess, however, upon being asked the question, that he had never known this law to be enforced—a statement in which the Lord Chancellor concurred. His Lordship also strongly condemned the existing condition of the law in respect of "one man" companies.

Justice Romer disagreed with the proposal to extend the liability of directors, as likely to frighten really responsible men from accepting directorships. Upon this head his Lordship observed: "If you make it too difficult to work "companies in this country, the result may be to lead to "the establishment of companies abroad, which would "simply be worked by agents in this country." The learned Judge said several other wise things which did not bear out the popular conception of a Judge as a gentleman presumably "learned in the law," but certainly ignorant of everything else. He remarked that directors occupy a difficult and peculiar position. The real workers are the managers—the directors being a deliberative rather than an executive body. Directors are not at present liable for "want of prudence." Justice Romer, indeed, declared he did not know what "reasonable prudence" might be. Prudence is not everything in the conduct of a business; great commercial success in any undertaking usually depending upon something quite different. With regard to the responsibility of framers of prospectuses, it may be useful to bear in mind the Judge's definition of the existing law, which is "that if a prospectus is misleading "in any material respect, the person who takes shares on "the faith of it can get off his bargain. Moreover, he can "get off his bargain even for the concealment in a pro-"spectus of a material fact, if the material fact concealed "is such as to render the statements in the prospectus as "they stand with the omission misleading." On the subject of "one man" companies Justice Romer is unable to offer an opinion.

The Report and Accounts of the Commercial Gas Company.

THE report and accounts of the Commercial Gas Company appear in another column; the half-yearly general meeting being called for Thursday. The report is in the usual stereotyped form, stating that the revenue account shows a net profit for the half year of £47,447. This added to the amount brought forward makes £55,761. Deducting therefrom £4028 for interest on debenture stock and loan, there remains to the credit of the net revenue account a balance of £51,733 available for distribution. Out of this the Directors recommend the payment of dividends after the rates of 13½ and 10½ per cent. upon the old and new stocks of the Company respectively. A difference of ¼ per cent. thus left between the declared and the authorized rates, under the sliding-scale, is to be carried to the reserve fund. The profit balance for the corresponding period of the previous year amounted to £43,006. The report contains one special announcement—that further capital is required, and that resolutions will be submitted to the proprietors at the meeting authorizing the raising of the same in conformity with the Company's Act of 1875. This subject was discussed at the last meeting of the Company; it being known that the step now notified could not be indefinitely deferred. The present accounts show that the Directors have obtained £110,000 as a temporary loan; there being an actual deficit of £28,445 on the capital account. The Company have had an uncommonly good half year; their increase of gas accounted for having been 7½ per cent.—probably the largest in the history of the undertaking. They have also done better than most gas companies in the matter of sulphate; but they share the common lot in having sold more coke for less money. The interest of the coming meeting will be mainly financial, in reference to the new capital issue; the accounts otherwise not presenting much debateable matter.

The British Gaslight Company—The Retirement of Mr. Linging.

THE British Gaslight Company, Limited, rarely comes prominently before the public as a whole, though the doings of the scattered branches of the Company are well known. The undertaking is an interesting survival of an order of things in gas supply long since passed away, when the assistance of outside capital and organization was requisite to enable many localities to obtain a supply of gas. The Company held a half-yearly general meeting at the London offices on Wednesday last, under the presidency of Mr. John Horsley Palmer, when a satisfactory account of progress and profit was given, as will be seen by the report which appears in another column. It is appropriate to mention specially this particular meeting, for the reason that it marked the retirement of the late Secretary—Mr. Frederic Lane Linging—after a service of upwards of thirty-eight years. Mr. Linging's is one of the best-known personalities of the administrative side of the gas industry; and it is not too much to say that it has always been one of the most highly esteemed and respected. Everybody, in short, to use a colloquialism, who knows the British gas industry knows Mr. Linging, and likes him. Thirty-eight years is a long time; and in this period he has seen the industry at large, and his own Company in particular, pass through many vicissitudes and changes. Time, however, which has tried and proved the man, has also established the industry with which he was identified. If the British Gaslight Company, with all its peculiar characteristics, occupies a sound and improving position to-day—which is certainly the case—this happy result is greatly due to the exceptional personal gifts and acquirements of the late Secretary. Last Wednesday's meeting was like a *levée* for Mr. Linging, who was able to look round the room upon one of those "troops of friends" described by the poet as falling among the due accompaniments of

honoured old age. Whether present or absent on this occasion, there are many habitual readers of the "JOURNAL" who will heartily join with the Board and the shareholders in wishing Mr. Linging prolongation of life and health to enjoy his well-earned repose.

The Growing Popularity of Gas on the Continent.

IN another column will be found our usual abstract of the annual report and accounts of the German Continental Gas Company. The most striking feature of this year's statement of the General Manager—Herr W. von Oechelhaeuser—is the information that the past year was distinguished by the largest increase in the make of gas since the formation of the Company forty-two years ago. This is really a very noteworthy statement, and adds one more to the proofs that other gas undertakings have accumulated of the extraordinary advance of gas in popularity during the past year or two. Thus we see that, not only in the British Isles, but all over Europe, the elaborately constructed fiction that the gas industry is in a moribund state is belied by the stubbornest of facts. Several causes have contributed to produce this state of things; but chief among them must be ranked the incandescent gas-burner. When the German Continental Gas Company can say that the number of these burners in use over their system has increased by nearly 45 per cent. for a single year, nothing further is needed to show which way the taste of gas consumers points. The use of gas for heating, cooking, and motive power appears to be extending throughout the towns served by the Company, but slowly. This slackness is hardly to be wondered at, since the terms of most of the concessions under which the Company work do not favour the consumption of gas in large quantities for other than lighting purposes. It is encouraging, however, to learn that at Dessau there is a growing demand for gas for tramway working; the consumption for this purpose now amounting to nearly 14 per cent. of the total production in the town. This new branch of business helps to account for the enormous increase of 18·3 per cent. in the gas consumption of Dessau; but even so the growth of the undertaking is remarkable. The Company have an electricity supply station here, which is doing a good and growing business. The central station is worked wholly by gas power; being the only establishment of the kind on the Continent.

The Labour Topic of the Week.

IT was reported on Saturday that the lock-out and strike notices received and given in respect to the north-east coast shops by the Amalgamated Society of Engineers had been withdrawn pending the conference with the employers' Federation. Meanwhile, the provisional arrangement discussed in our reference last week to this dispute has been carried out. The machine minder at Pallion has been withdrawn from his employment for the time being, and the Society men who struck against him were expected to return to work yesterday. The conference is to be held in London on Thursday; and it is understood that the question of the class of workmen who are to attend self-acting machines will be one of the chief matters to be settled on this occasion. It is, indeed, high time that a definite understanding should be arrived at in this regard, as well as upon other fundamental points of practice in engineering workshops. It is to be noticed that the "The "Times" professes to be sanguine as to the results of this conference, as well as of another in which the same Trade Society is to take part with the object of considering the question of overtime. We cannot, unhappily, regard these pending meetings in the same hopeful spirit. To our observation, it looks as if the Amalgamated Society of Engineers had become too deeply infected with the pernicious mixture of new Collectivism and the old machine-wrecking spirit, which passes for an aspect of the New Unionism, to come to reason so easily. Our daily contemporary is not blind to this consideration, either; for its leading article of Saturday, on the temporary truce in the trade, concludes thus: "For the time, what "would have been a national misfortune and scandal "has been averted. We would fain hope that many "members of the Amalgamated Engineers have made up "their minds not to renew claims to fetter the efficiency "of labour. But one cannot feel absolutely confident. "There prevails in some trades a mischievous tradition on "this subject; and so we hear of joiners and carpenters "refusing to do certain work themselves with the aid of "machinery, or to allow others to take their place. For "such people, Adam Smith and political economists in "general have written in vain; and they seem to be "insensible even to the dictates of fair play." This is a very mild way of putting the issue. Nobody objects to workmen organizing themselves for their own defence; but when their organizations presume to set bounds to invention, and to put whole industries in fetters, they must be resisted to the uttermost. It would doubtless be a national misfortune and scandal if there were to be a strike and lock-out in the engineering trade over such issues as those which are to be considered by employers and employed before the week is out. But there is a worse thing than a strike, and that is the ruin of a national industry. There are several British trades now languishing under the domination of Trade Unions, which might have been saved if the employers had asserted themselves years ago, and maintained the mastery of their own business. If experience in such matters has any lesson at all, it is the hard but salutary one, that the moment men begin to hamper a trade—whether in regard to the quantity of work turned out per man, objection to machinery, or anything else—unless the masters take their stand, the trade is ruined. Better lock out the malcontents at once than parley with the forces of disintegration. Hence it is to be hoped that the engineering employers will never consent to waive their right to conduct their business as they find most advantageous, to employ whom they please, and to adopt whatever methods of working they prefer. This is the strong course; and it is the only safe and sure one for all parties in the long run.

WATER AND SANITARY AFFAIRS.

THE rejection by the House of Commons of the London County Council's Purchase Bills led to an onslaught being made on Mr. Boulnois at the Council meeting on Tuesday last by Mr. Benn—apparently on the principle that, having no case, it was a relief to the feelings, and served also as a show of defiance, to attack somebody. Mr. Boulnois, as a member of Parliament opposed to the Progressives, and a Director of a Water Company, was especially obnoxious to the promoters of the Purchase scheme, and was denounced by Mr. Benn as the "chief executioner" of the rejected Bills. If we are to accept all that Mr. Benn has said concerning Mr. Boulnois, the whole future of the London Water Question rests with the latter gentleman. Lord Onslow is nowhere, and the House of Commons simply deals with the Water Bills in accordance with the wishes of the Deputy-Chairman of the West Middlesex Water Company. Henceforth, instead of laboriously drafting these Bills, the Parliamentary Committee are advised to consult Mr. Boulnois, and are presumably to adopt his conclusions. To such a desperate issue has the question arrived in the estimation of Mr. Benn. But does it not occur to Mr. Benn and his coadjutors that there is something extravagant in the notion that a vote of more than two to one against the Purchase Bills in the House of Commons is due to some overwhelming influence exercised by Mr. Boulnois? If the House of Commons cared about it, they might resent the imputation. So also might the Government, who, according to the report of the Parliamentary Committee, supported the rejection of the Bills. But neither these high authorities nor Mr. Boulnois are likely to be moved by the denunciations indulged in by Mr. Benn. The position taken by Mr. Boulnois in the Council was simply one of calm indifference to the attack made upon him by the Progressive champion. But there was a very potent exposure of one of the boasted achievements of Mr. Benn and his friends. By bringing the Chamberlain's clause to bear on the Staines scheme, they had taken away an annual rebate of £20,000 from the West Middlesex consumers. To drive headlong at the Water Companies appears to be the sole policy of the Progressive party, let the damage fall where it may.

At the meeting of the Council to-day, a report is to be presented by the Parliamentary Committee on the Bill of the Southwark and Vauxhall Water Company. Of course, the Bill is to be opposed; the Committee being of opinion that its general effect will be to create a very large increase

in the value of the undertaking, such increase of value being gained at the mere cost of an Act of Parliament transferring to the Company water which is public property, and in the flow of which London is very largely interested. In other words, the water in question, instead of running into the sea, will be diverted for the benefit of the consumers. But the Committee consider there is no need to be in a hurry about this matter, as the Conservators of the Thames have consented to the Company taking an excess of water, despite an injunction to the contrary, pending an application to Parliament for power to draw an enlarged quantity. Whether the Conservators are willing to wait the pleasure of the Council is another matter. The latter, as usual, are quite indifferent as to whether or not the water supply shall run short. Any proposal to enlarge it so as to meet the demand is declared to be a matter requiring due notice and careful consideration for the protection of the important interests concerned. What interests are there beyond the absolute need for an adequate water supply?

The prolonged correspondence in "The Times" on the London Water Question serves to show how hard a battle Mr. Shaw Lefevre has to fight against the facts. In one of his letters, he disclaims the imputation of having "admitted the knowledge," in 1894, that the East London Company were urgently in need of an increased supply of water. Perhaps Mr. Shaw Lefevre had not "admitted the "knowledge;" but that he ought to have been in possession of it is shown by a communication which the Company addressed to him on the 29th of March in that year, and now quoted by Mr. Crookenden, in which the case of need was distinctly stated. Mr. Shaw Lefevre was then President of the Local Government Board; but he vouchsafed no answer to the letter, and by his subsequent conduct he utterly ignored it. The old pretence is once more brought forward that the Company told Lord Balfour's Commission they had enough water to supply 53 million gallons per day. But the Royal Commission understood the matter in a very different way, and distinctly urged the necessity of further storage, for which the Company had then secured ninety acres of land. Mr. Shaw Lefevre's theory concerning the water famine is singularly contradictory. At one time he asserts that it was due to shattered mains and fractured communication-pipes; while at another time he contends that the real and ultimate cause of the water famine consisted in the "vicious system of "district areas and boards of management." This latter notion is ably dealt with by Mr. Banbury, who shows how the "vicious system" was to receive further development by the operation of the Purchase Bills. There is not a single allegation or argument used by Mr. Shaw Lefevre which has not been emphatically refuted; and yet it seems as if nothing would persuade this gentleman that black is otherwise than white. While Mr. Shaw Lefevre is concocting his inconclusive letters, it is satisfactory to find, from the half-yearly report of the East London Company, that the new works authorized by Parliament in 1894 are being vigorously pushed forward, so that the Directors are confident in saying all will be finished well within the stipulated period. Mr. Crooks has been stating in the County Council that in East London the question was not one of dividends, but of life and death. Mr. Crooks should understand that the question with the Company has not been one of dividends, or they would have restricted their capital outlay, had it been possible. That the matter at issue was one which affected the health and comfort of the consumers has been clearly apprehended by the Directors, who have urged this consideration on the notice of Parliament, and at last not unsuccessfully. But what respect have the County Council shown to the "life and death" question? Only so far as the survival of their immaculate Bills was concerned. To keep these from being killed was their supreme concern.

The Annual Informal Meeting of Scottish Gas Managers.—We learn from Mr. J. M'Gilchrist, of Dumbarton, the Convener of this meeting, that it is to take place at the North British Station Hotel, Glasgow, on Wednesday, the 7th prox., under the presidency of Mr. W. Smith, of Ayr. At the dinner which will follow, Mr. Alex. Bell, of Dalkeith, the President of the North British Association, will make the presentations to Mr. and Mrs. Carlow, of Arbroath, to which reference was made in the "JOURNAL" a fortnight ago.

ESSAYS, COMMENTARIES, AND REVIEWS.

GAS AND WATER COMPANIES IN THE STOCK MARKET.

(For Stock and Share List, see p. 735.)

HARDLY any change took place last week in the general position of affairs on the Stock Exchange. Business remained extremely quiet throughout, although now and then there was a faint flicker which promised to brighten things up a bit. The public, however, were not at all disposed to speculate; and beyond the normal proportion of investment transactions, operations were pretty well confined to the inner coterie. There was a good firm tendency for most of the time; but a feeling of apprehension regarding Eastern affairs towards the end caused the closing prices in some markets to be below the best of the week. Still, quotations in general are better than they were a week ago, except in Americans. In the Money Market there was a good demand; but with the close of the fiscal year next week, the prospect is towards a great rise. In the Gas Market, there was a fair amount of business at first; but about the middle of the week, it fell very calm, and did not recover again. The general tendency was not so good; prices in general being easier, and, with few exceptions, the changes in quotation are downward. In Gaslights, the "A" opened far from strong, and fell away point by point, until the closing mark was no better than 309. The secured issues, however, were in demand for investment, and commanded good figures; the "K" in particular scoring an advance. South Metropolitan also was easier; and the price receded a point. A couple of transactions in the old stock saved Commercial from stagnation. The accounts to hand show that, like the other Companies in and around London, they have had a nice increase in the sale of gas. The Suburban and Provincial Companies were almost untouched throughout the week. But Bristol had a fair advance; and those quoted *ex div.* got the benefit of the turn. The Continentals were all flat—European and Union being affected by the unrest in the East, and Imperial by its local municipal trouble. All lowered their quotations. Movements among the rest were not generally conspicuous; but Chicago bonds had an advance. Business in the Water Companies was almost at a standstill; and no changes in quotation took place, except in two or three debenture stocks, which were quoted *ex div.*

The daily operations were: At the opening on Monday, Gas was fairly steady; but it did not keep strong. Quotations, however, did not fall; and Chicago bonds rose 3. There was more activity on Tuesday, coupled with a weaker tendency. Gaslight "A" dropped 1; and European and Continental Union, ½ each. The general features on Wednesday were much the same. Gaslight "A" fell another point, and South Metropolitan also receded 1; but Gaslight "K," and Chicago bonds advanced 1 each. In Water, Lambeth debenture had a relapse of 1½. Business in Gas on Thursday fell extremely quiet; and prices were still inclined to droop here and there. Gaslight "A" moved back 1 more; but Bristol improved 2; and British, ½. Friday was quiet; and quotations held on without any change. Saturday developed some further weakness. Continental Union fell 3; Imperial, 2; and Buenos Ayres, ¼.

ELECTRIC LIGHTING MEMORANDA.

The Puzzle of Electrical Units—Whence Come the Units?—The Nature of the Concept—The Fact of Measurement.

OUR electrical contemporaries have been making merry of late over the performances of a wretched man who, writing in a trade journal ostensibly for the instruction in matters electrical of the "three-branch hand," got terribly mixed in regard to the units of electrical measurement. It indeed argues the existence of a high degree of incapacity in any writer on this subject when he blunders openly over the definition and explanation of these units; because it is so easy to copy from a text-book all that is necessary to pass muster in this respect. There would be a sudden stop to the production of what are called "elementary" papers upon all technical subjects, if there were no "cribbing." Whether this consummation might not be desirable, is for the moment beside the question. As a rule, a so-called elementary instructor upon technical and scientific subjects, such as may often be met with in the pages of second and third rate trade periodicals, is a person who knows so little of what he is talking about that he fancies himself just the man to impart this little to others. Himself the merest smatterer, he thinks he cannot get out of his depth in discoursing out of his small store of information to others utterly ignorant of the subject. The fate of these venturesome individuals is always the same, though they may get to it in different ways. No sooner do they begin to write than they discover their deficiencies as they never felt them before. This is peculiarly the case of the "practical" man beguiled into meddling with pen and ink. If he is a working electrician, he may be able to wire a house as well as another, and use the testing instruments put into his hands. But it is quite a mistake to suppose that he will be equally well able to describe in writing what he can do with his hands; and all beyond this is naturally also beyond him.

It would not be easy to ascertain precisely what working electricians understand by the units of measurement proper to the science of electricity. In the ordinary way, such a workman has more to do with his two-foot rule—like any other fitter—than with the electrical units. In his experience, these are simply marks on a dial. "A watt upon the index rim a simple figure was to him, And it was nothing more!" (with our apologies to Wordsworth). When an electrical fitter undertakes to write about these units, however, it behoves him to define, and, if possible, to explain them, as he would not think it necessary to explain his two-foot rule. In this case, a prudent man would, as already remarked, go to an unexceptionable text-book, and copy what he wants; carefully refraining from any attempt to abstract from or to translate the authority. This is what the victim of our contemporaries' gibes did not do. On the contrary, he tried to explain in his own words what the words "ohm," "volt," and "ampère" conveyed to his own intelligence; and, naturally, he fell. It occurs to us to ask how many of those who know well enough what are the accepted definitions of the terminology of electrical measurement—who can tell who Ohm was, and Volta, and the rest of the immortals whose names have been borrowed for use in this connection—could lay their hands upon their hearts and declare with truth that they understand the electrical units. Is it not the truth, rather, that the majority of those who are accustomed to the use of these units would fail miserably if asked to give an intelligible account of them, still more to say what they understand by Ohm's law?

We are fully conscious of the risk we, as outsiders, run in raising this question of the intelligibility of the terms of electrical measurement. Take, however, the lesson given by Mr. W. H. Preece upon this subject in his recent Watt Anniversary lecture. He is reported to have said that "the ohm is the unit of resistance which has to be overcome in any case of the flow of electrical energy; the volt is the unit of pressure which maintains this energy through this resistance; the ampère, the result of one volt acting through one ohm, is the unit of current; and the coulomb is the unit of that electrical quantity which is being driven." Is this a simple statement, intelligible to the ordinary capacity—say, of the British workman described by Rankine, who "eats by the pound, drinks by the pint, and works by his three-foot rule?" Nay, more—does it succeed in conveying the impression that the illustrious speaker knew what he was talking about? The last definition, at any rate, is a nut that few are likely to be able to crack unaided. The fact is that, in order to grasp the meaning of the simplest electrical measurement, the mind has to realize simultaneously three separate and distinct concepts, all of an abstract kind. The first quantity the electrician asks us to take account of is a negative one—resistance. It is impossible to conceive the result of an electrical measurement without wrestling with—or, in the usual way, accepting in the light of working entities—several highly metaphysical conceptions, beginning, as we say, with the purely negative one of resistance. We are sometimes bidden to figure to ourselves electrical data as similar to those of hydraulics. In this way, instead of starting with our pint, we can imagine it, if we are able, as the result of a certain pressure of water acting through a pipe of a particular size and length. And, after all, the pint does not come out of the pipe; because we get our ampère—its electrical equivalent—only as the result of the exact balancing of the pressure and the resistance, the effect of which would naturally be *nil*.

Of course, it is all right. Electrical measurement is a substantial fact, upon which much money changes hands every day. There is no better guarantee of the validity of a fact than this. All the same, to pretend that the comprehension of electrical units is possible by the same intellectual operations that enable the ordinary man to appreciate his pound, his pint, and his foot measure, is to misrepresent the elements of the subject. For all the display of rigid scientific establishment and arrangement that surrounds them, electrical measurements are as arbitrary as the furlong, the land yard, or the gill; while they are, and must remain, much less intelligible. Mr. W. H. Preece, in the lecture already mentioned, tried to discredit the engineer's unit of the "horse power;" but it is more to the point to say that it was only when electrical measurements came to be brought alongside this well-known unit that engineers began to understand how to deal with them. Even power is a concept that implies three components—weight, space, and time. But every one of these is a reality of common experience; and they are all positive. It is, however, unnecessary to labour the point. We occasionally receive from correspondents requests for enlightenment on the mysteries of electrical measurement; but we do not reply by offering them any interpretation of our own. There are text-books of electricity to be had for the asking, at a reasonable price; and it is the business of the authors to explain the import of the terms of art which they employ.

The Rating of Engineering Undertakings.—A paper on this subject will be read by Mr. P. Michael Faraday at the meeting of the Society of Engineers next Monday. The author will discuss the importance to engineers of a knowledge of how rates are levied on undertakings under their control; deal with receipts and expenses; and explain the principles of assessment as applied to gas and water works, dead and live mains, gasholders, retorts, reservoirs, &c.

THE STORY OF MUNICIPAL GLASGOW.

In opening the handsome volume prepared by Sir James Bell with the object of giving the world an account of the stewardship discharged by himself and his honourable predecessors in the office of Lord Provost of Glasgow,* one's first impression is naturally one of thankfulness that a story so well worth telling has at length been set forth in a manner and on a scale commensurate with the importance of the subject. It is unnecessary to state the claims of Glasgow to the closest study of those who are for any reason interested in the modern developments of municipal institutions. Glasgow not only ranks as the second city of the British Empire in respect of population and wealth. It is perhaps the first of the world's cities for the extent to which its Local Authority has realized and applied the highest ideals of modern local self-government; and it is second to none in regard to the efficiency with which municipal duty is done. And just as the mercantile eminence of Glasgow has been attained in spite of certain grave natural disabilities rather than by virtue of antecedent advantages, so its municipal supremacy has been worked up to in despite of the absence of much that is commonly held conducive to the creation and maintenance of a lofty standard of local patriotism. Without a history linking the site with the romantic chronicles of the nation, with no natural beauties of situation, and with no obvious defence against the disparagement long meted out to its provincial nobodies by the brilliant leaders of society in the Scottish capital, why should Glasgow flourish? What was the power that should lift its early squalor, which so late as the close of the first third of the present century weighed like an ugly nightmare upon the sensitive perceptions of Thackeray, into the present prosperity of St. Mungo's City? This is what Sir James Bell set himself to make clear, with the aid of his literary colleague, Mr. James Paton; and it is for us now to inquire how he has sped in the effort.

Let us begin by acknowledging that every important city and town in the United Kingdom ought to have its municipal history written by a competent hand, with the object of setting out for the instruction of posterity the cause of that development, such as it is, by which it has become what it is. Sir James Bell tells in his prefatory remarks how, when he was Lord Provost, and as such deeply plunged in contemporary municipal affairs, he felt the want of some reliable clue to the course by which all this business had arisen. What had been the order of the evolutionary process through which this modern Glasgow had come to be what he found it? Not finding any such help as he required, he took the first opportunity of supplying it himself—thereby unconsciously illustrating the method by which advances are made in every field of human enterprise.

One's curiosity is pleasantly whetted by the very first lines of this book, which, instead of choking the reader off with a dry declaration, in the manner of school books, as to the situation, population, and so forth, of Glasgow, simply tells how "according to tradition, it was while taking his accustomed walk in Glasgow Green, on a pleasant evening in the spring of 1765, that the idea of the separate condenser to the steam-engine flashed across the mind of James Watt." It was the improvement of the steam-engine that caused the growth of manufacturing towns, and made Glasgow, amid other places, possible. People began to swarm into the towns where employment was most easily and certainly to be obtained; and for a long time nobody perceived the consequences of this massing of the population, in which all the problems of modern town administration may be said to have originated. The Town Councils of those days were not the bodies we now know by the same name. They were certainly not sanitary authorities; and it was only when the periodical epidemics attained such virulence as to threaten the continued existence of the centres of population, that public health became a corporate care. The beginning once made, progress has been continuous. "As regards the health and comfort of dwellers in towns, down even to the lowest stratum, incalculable good has been effected. Unfortunately, the evils attendant on city life neither begin nor end within the cities. They pollute equally the heavens above and the earth beneath. The sky for miles away is darkened with fog-begetting clouds of smoke; and the watercourses are poisoned with all the burden of pestilent refuse they will carry. Till these two crying evils are remedied as far as current knowledge and practical skill permit, country populations will have just and heavy grievances against the dwellers in towns."

Next to sanitation comes the question of public supply services. Sir James Bell does not stop to discuss the abstract question of how far it is the duty of a local authority to become a universal provider. "The municipal right of control over undertakings which, in the case of Glasgow, at least, have been absorbed—the water, the gas, and the tramways—can be defended on quite other considerations. Water, like air, is an indispensable requisite of existence; like air, it should be free to all, and so it is. There is no private property in the element; and it is only

* "Glasgow: Its Municipal Organization and Administration." By Sir James Bell, Bart., Lord Provost of Glasgow, 1892-5, 1895-6; and James Paton, F.L.S., President of the Museums Association of the United Kingdom. Glasgow: James MacLehose and Sons, Publishers to the University; 1896.

for its distribution, for bringing it to the door of every citizen, that a rate, on the convenient basis of rent, is levied. Gas, electric light, and tramways are on a different platform. It is open to any citizen to use these conveniences or to supply himself with such illuminants and conveyance as he may elect. He is called on to pay only for the service he receives; and that service is made self-supporting, but it is not a source of profit." It could be wished that the last observation had a general application.

It would be in the highest degree interesting to follow Sir James Bell through his masterly exposition of the ancient history of Glasgow; but we have no warrant for doing so here, albeit the spelling of some of the old municipal ordinances is an almost irresistible attraction. From early times, it is satisfactory to observe, the Town Council exercised particular care for the good lighting of the burgh. The present Gas Committee had their direct ancestry in the Local Authority of the seventeenth century who ordered, as we are told, that "tallow was not to pass out of the town in great quantity till after Faustrenes evein"—Shrove Tuesday—a provision for the dark evenings of the winter; it was to be sold at a specified price per stone, and candles at a stated price per pound were to be "small wickeit and weill tallownit." From this passage we have, very reluctantly, to pass over many pages of the book until we find, in Chapter XXVI., the subject of "Corporation Gas and Electricity" systematically treated. Sir James Bell, having already mentioned gas distribution as possessing the nature of a natural monopoly, goes on to observe that "illuminating gas is an essential convenience of a modern civilized city, and the citizens are entitled to obtain it under the most convenient and least onerous conditions possible." The first step in the realization of this aim is the restriction of the supply to one particular source. "Free competition in the gas industry is an obvious impossibility; and even the rivalry—we do not say competition—of two companies, is carried on with such needless duplication of distributing pipes and other plant as to greatly increase the expense of the manufacture without any compensating advantage. . . . The legislature itself, at an early period, recognized the impracticability of competition, when by statute a limit was set to the profits which any gas company could legally divide." Sir James Bell admits that the Company stage in the gas industry was indispensable to its development, inasmuch as a Corporation cannot be a pioneer. "For half-a-century the making and distribution of gas was a Company enterprise in Glasgow. The shareholders received a good return for the money they invested; and in the end they got a generous price for the properties they were called on to hand over to the Corporation." The history of the Glasgow Gaslight Company is most instructive. It was incorporated in 1817 with a share capital of £40,000, and power to borrow £10,000. The Act contained the proviso that, before the Company could declare any dividend, they were to lay aside a sum of not less than £2000 or more than £3000, out of profits, to meet contingencies. The Company began to supply gas in the following year; and the advantages of the new light were so immediately and widely recognized that within four years the Company had to go to Parliament for power to double their capital. At the same time, the contingent fund was increased to £5000. In 1825, the Company were again in Parliament, and obtained power to increase their capital by £20,000. This was a remarkable rate of progress. The Act contained the important proviso that "ay and until there be another Company incorporated by Act of Parliament or otherwise for the supply of the city and suburbs of Glasgow with gas, the annual dividend of the said Glasgow Gaslight Company shall not exceed in any one year ten per centum per annum." The very next year, the Company were in Parliament for another £50,000, and in opposition to the proposed incorporation of a competing Company. "They were successful in both issues, and received authority to sell to the public 2000 shares of £25 each; and it was enacted that the premium realized from such transaction should be expended on extending and improving the works, and that no part of it was to become a fund for division among the proprietors, so as to form a source of individual profit. By the sale of these shares, the Company realized a premium of £49,724, which, added to the £150,000 of dividend-bearing capital, raised the total to £199,724." This is, we believe, the first instance of the application of the "auction clause" to a gas undertaking; and the record shows how well the Company must have prospered under the wise ordinances that had preserved their natural rights and fostered the development of their business.

Troublous times, however, supervened. The public became dissatisfied with the administration of the Company; and charges were made against the Directors that they were not sufficiently particular in seeing that the profits did not exceed the statutory figure, and that they enlarged their works out of revenue, to the disadvantage of the consumers. Some colour is lent to the latter charge by the circumstance that many years passed without the Company going to Parliament for further capital powers. In 1843, the agitation against the old Company culminated in the incorporation of a rival, "The City and Suburban Gas Company of Glasgow," with a capital of £150,000, and borrowing powers to one-sixth of this amount. The new undertaking got to work with vigour in the following year; and thenceforward "the citizens had such benefit, or otherwise, as the existence of two Companies with similar statutory powers was calculated to yield them." In 1857, the Companies went to Parliament for further powers, and were opposed by the Corporation. The opposition failed to stop the passage of the Bills; but both Companies were fain to enter into provisional agreement with the representatives of the Town Council for the sale of their undertakings to the Corporation, in consideration of the payment to the proprietors of perpetual 8 per cent. annuities, or a cash payment of double the amount of the individual proprietors' holdings.

The Town Council failed to support the action of their representatives; and so the bargain fell through. By the new Acts, each Company obtained leave to sell by auction £50,000 of additional 7½ per cent. capital. The popular agitation against the suppliers of gas was intensified rather than soothed by these transactions. An investigation of the Companies' books was ordered by the Sheriff of Lanarkshire in 1859, when it was shown that, though the City and Suburban Company had steadily paid their full 10 per cent. dividend, it had never been well and truly earned. In regard to the old Company, it was found that the unaccounted-for gas had for three years averaged nearly 24 per cent. The Gas Consumers' Committee, who had been instrumental in bringing about this inquiry, stultified themselves by reporting in favour of the establishment of yet another Gas Company, as the best means of meeting the wants of the public. The Town Council of the day, however, came to a wiser conclusion in this regard. After much heart-searching debate, they unanimously resolved to approach the Companies with a view to taking over their property. An offer was made on behalf of the town, and declined. All the parties went to Parliament in due course; and in the event a Bill was passed authorizing the transfer. The 10 per cent. shareholders received 9 per cent. perpetual annuities, and the 7½ per cent. shareholders received 6¾ per cent. annuities—the mortgage debts of the two Companies being also taken over. The Corporation entered into possession of the gas undertakings on June 1, 1869. At the time the old Company had three manufacturing stations—at Townhead, Partick, and Tradeston. The City and Suburban Company had one large station, at Dalmarnock. Competition, in the true sense of the word, had, of course, ceased between the two Companies for many years; and in the last year of their existence the average price of gas, subject to discounts, was 4s. 7d. per 1000 cubic feet. In the second year of their gas making, the Town Council reduced the price to 4s. 2d.; allowing only half the former discounts. The bugbear of the responsibility of the ratepayers of the city for the gas property, accentuated as this theoretic fact was by the existence of a statutory right to levy a 6d. rate as an additional security for the gas loans, induced the Corporation to charge 2½d. per 1000 cubic feet more for gas supplied beyond the city bounds. This differential charge, Sir James Bell confesses, "was productive of much trouble, and, as things turned out, of heavy cost to the Corporation." Certain outlying consumers, feeling aggrieved thereby, formed the Partick, Hillhead, and Maryhill Company, Limited, who began to supply gas in 1873, and lived on in defiance of the Glasgow Corporation until they were bought up by the latter at a considerable premium, in 1891. Sir James Bell is evidently cognizant both of the pluck and perseverance of the Partick Company, and the mistaken policy of the Glasgow Corporation which rendered such an adventurous concern possible. Curiously enough, the Corporation have been glad to make use of the site of the Temple works of the Company.

It is unnecessary to reproduce here the statistics given by Sir James Bell to illustrate the actual condition of the Glasgow Corporation gas undertaking. Fortunate in their policy, and not less so in their agents, the Corporation can fairly claim to have justified the legislation which put the gas supply of the city into their hands. Sir James Bell has some general observations to offer on the subject of the gas supply which demand respectful consideration here. In regard to the character of the supply itself, which he says is "not permitted to fall under an average of 22-candle" power, he remarks that among the provisions of the Act of 1882 there is one empowering the Corporation to make and sell gas "for heating, for power producing, and other non-illuminating purposes." There has not been any attempt hitherto to manufacture a special non-illuminating gas in Glasgow, for reasons which are given; but Sir James Bell refers to the popularity of gas-stoves, the number of gas-engines in use in the city, and the incandescent burner itself, as evidence of the large consumption of gas for its heating value rather than for its illuminating effect. "Were the use of incandescent lights to become general, and the ordinary burner to become as much a thing of the past as the oily cruisie, then might high candle power gas also cease to be made. Gas would become entirely a heating and power-producing agent; it would be a light-producer not from its flame, but more economically from its heat; and its heat also would be the quality of value for all its other uses." From all this, it would appear that Sir James Bell is a gas administrator of singularly open mind.

Upon the all-important subject of gas finance, Sir James Bell is particularly well advised. He declares that the Glasgow Gas Committee act upon the principle of making the consumer pay his fair proportion of the cost and risk of carrying on the business. There is no thought of benefiting the gas consumer at the cost of the living citizens. There is a sinking fund to reduce the investment gradually; and if, in time to come, anything should turn up to render gas lighting obsolete, then the

generation that reaps the benefit of such a revolution in lighting methods will have to pay for it. "Nor have the Town Council of Glasgow been tempted to earn a profit from their gas industry whereby to foster other, but alien, objects. The man who burns gas in Glasgow and its suburbs is assured that he is thereby called on to pay for gas only, and not for palatial erections, for libraries, or art galleries, nor for any other public object, however laudable and desirable. And yet the temptation to apply gas revenues to other than gas purposes was considerable, and the right was indisputable. The Town Council had the precedent and example of several English Municipalities in which surplus gas revenue is systematically applied to other public purposes. The Council, moreover, are supplying a widespread population with gas at a cost far below what these scattered communities could produce gas for themselves, and the city receives no benefit in return from the consumers. In the gas-rents, the Council had the means and the right to secure and to divert substantial profits to such public purposes within the city as they might deem proper. But they have justly and prudently refrained from exercising their right; and the consumer's gas bill, as nearly as practicable, represents the cost of the illuminant as it is consumed."

We have nothing more to say about Sir James Bell's book except to congratulate the citizens on having their corporate history told so well. The book is in every way creditable to the authors and the printers; and if it had only been illustrated it would have been perfect.

Coal-Tar Bases.—Herr F. B. Ahrens has isolated a new lutidine and collidine from coal tar, which he found to boil at from 163·5° to 164·5° C. and 165° to 168°C. respectively.

Acetylene.—The Swiss Ministry of the Interior at Berne is drawing up a series of regulations with reference to acetylene. In the meantime it has been decided to forbid either the manufacture or use of acetylene, except where the necessary official permission has been obtained.

Books Received.—"The Gas and Oil Engine." By Dugald Clerk, Assoc.M.Inst.C.E., F.C.S, &c. Sixth edition, revised and enlarged. (Longmans, Green, and Co.) "Fuel and Refractory Materials." By A. Humboldt Sexton, F.I.C., F.C.S. (Blackie and Son, Limited.) Chapters on Finance from "Burdett's Official Intelligence." (Spottiswoode and Co.)

Subways in the City of London.—According to the report of the Engineer to the Commissioners of Sewers of the City of London (Mr. D. J. Ross, M.Inst.C.E.), on the works executed by the Commissioners during the past year, there are in existence at the present time about 2360 yards, or nearly 1½ miles, of subways beneath the City streets under their control. The length of gas, water, and hydraulic mains, telegraphic, telephone, pneumatic tubes, and electric lighting conduits, laid in these subways, amounts to 7½ miles. Access, under proper supervision, is given to the officers and workmen of the various companies; and the Inspector in charge reports that 4717 workmen and others were admitted for various purposes during the year.

Electrolysis of Gas and Water Mains.—A leaky gas-pipe in one of the Brooklyn streets revealed the fact that destruction to both gas and water pipes by stray electric currents was going on, and in this case caused the escape of gas. This led to an investigation, when it was discovered that gas and other pipes were badly corroded in the locality; and the subject is to be investigated by a Committee of the Council. The New York correspondent of the "Electrician" understands that suits are to be instituted against the trolley companies by the gas and electric light companies whose property is in jeopardy. Early last month, a fracture was discovered in a 6-inch water-main in Salt Lake City, Utah; and, on digging up the ground, the accident was found to have been caused by electrolysis—the iron in the main at the break having been made so soft by the action of the electric current that it could be readily cut with a knife. The Superintendent of the Water Department (Mr. H. C. Wallace) has asked the City Council to authorize him to test the condition of the whole of the 124 miles of piping in the city; and the City Engineer (Mr. F. C. Kelsey) has been instructed to report on the matter.

Liquid Ammonia from Gas Liquor.—A great part of the gas-works ammonia which was at one time worked up to a highly saturated solution for refrigerating purposes has been superseded by the liquefied ammonia gas which comes on the market in iron cylinders. This ammonia, being in the highest possible state of concentration, is used in ice-making machines without further treatment. Aspersions have recently been cast on its purity; and to combat these, Dr. H. Bunte and Dr. P. Eitner, of Carlsruhe, devised an analytical method for its examination, which is described in the "Journal für Gasbeleuchtung." It is based on the evaporation through weighed potash drying-tubes of a carefully weighed amount of the liquid ammonia. Notwithstanding statements—doubtless based on inexact analyses—that the commercial article contained large quantities of water, these investigators found only 0·49 per cent. of impurities in a sample from one of the largest producers. The impurities consisted partly of organic substances, so that the actual amount of water was very small indeed. By the ordinary process of liquefaction, the ammonia gas is carefully dried by quicklime before it is compressed, and water is scarcely a likely impurity of the liquid.

PERSONAL.

Mr. F. C. Andrews has been elected Chairman of the Bury St. Edmunds Gas Company, in succession to the late Alderman Ridley.

The vacancy in the managership of the Rhos Gas-Works, caused by the removal of Mr. J. A. Fielding to Bastia, as already announced, has been filled by the appointment of his brother, Mr. H. Fielding.

M. Solvay, of Brussels, who owns large industrial establishments in the neighbourhood of Nancy, has given 100,000 frs. to the University of the city for the purpose of erecting a chemical and electrical laboratory.

On the eve of his departure for the United States, Mr. J. T. Westcott, of the Economical Gas Apparatus Construction Company, Limited, was entertained at the Whitehall Club by a few intimate friends desirous of marking their appreciation of one who, since his arrival in this country some two years ago, has done so much to popularize the Merrifield-Westcott-Pearson carburetted water-gas plant, to which he has devoted his time and talents. Mr. Westcott has within this comparatively brief period fitted up machinery in various parts of the kingdom capable of producing some 13 million cubic feet of gas per day. Mr. Westcott's stay in the States will be only a brief one.

At a smoking concert held by the employees of the Hastings and St. Leonards Gas Company on Monday last week, presentations were made to Mr. C. E. Botley, M.Inst.C.E., the Company's Engineer and Manager, and to Mr. J. T. Piper, the Accountant, in recognition of the many benefits they have secured for the workmen. The feelings of the men towards Mr. Botley were conveyed in an illuminated address, the inscription on which was as follows: "Charles Edward Botley, Esq., M.Inst.C.E. We, the *employés* of the Hastings and St. Leonards Gas Company, desire to express our heartiest thanks for your efforts in establishing a Workmen's Sick, Benefit, and Pension Fund. We think this is a fitting opportunity for thanking you for other concessions which you have kindly granted to all sections of the works in the past; and we heartily appreciate the good feeling that exists between employer and employed, and trust that you may be spared many years at the head of your department to strengthen this excellent undertaking." Mr. Piper was also presented with an address, inscribed as follows: "James Thomas Piper, Esq. We, the *employés* of the Hastings and St. Leonards Gas Company, desire to express our high appreciation of your thirty-two years' service as Secretary and Treasurer of the Workmen's Burial Society, and also of your eight years' services in the same capacity in connection with the late Workmen's Superannuation Fund. We take the opportunity for thanking you for your many kindnesses with respect to these Societies in the past, and trust you may be granted health and strength to favour us with your services for many years to come." The addresses were signed, on behalf of the subscribers, by Mr. M. Hooton and Mr. R. Brown, who presented them; and they were acknowledged by both recipients. The gathering was in every sense a pleasant one.

OBITUARY.

Mr. F. Crosland, the Vice-Chairman of the Huddersfield Corporation Gas Committee, died last Friday at the age of 64 years. He had been a member of the Council since 1891, and was held in very high esteem. By his death the town loses one of its most energetic and philanthropic sons.

Mr. W. Robson, who was from 1853 to 1893 Manager of the Selkirk Gas Company, died in that town on the 17th inst. Mr. Robson was a native of Hawick. About fifty years ago, he went to Selkirk as mechanic in a mill; and ten years later, he succeeded Mr. John Young as Manager of the gas-works.

We regret to record the death, on the 21st inst., at his residence, The Ferns, Lansdown, Bath, in his 79th year, of Mr. Charles Frederick Marshall, J.P., the senior Alderman in the Bath City Council, and Chairman of the Bath Gas Company. The public career of the late Alderman Marshall extended over forty years; for it was in 1858 that he first entered the Town Council. He had been a member of the Finance Committee since 1863; but it was in the Watch Committee, which he joined in 1862, and of which he was the Chairman, that his greatest interest in civic matters was shown. Deceased was a Freemason, having been one of the oldest P.M.'s and a Past Senior Grand Deacon of England. The funeral took place last Thursday at Charlcombe, and was numerously attended.

By the death last Thursday, at the age of 57, of Mr. Francis William Crossley, Manchester has lost one of her greatest philanthropists, and mechanical science a worthy representative. Mr. Crossley began life as an apprentice at the Armstrong works at Elswick, Newcastle; and about the year 1867 he entered into business with his brother, Mr. W. J. Crossley, and established the firm—now a limited company—which has had so successful a career in the manufacture of gas-engines. It is in this connection that his name will be best known to our readers; but it is for his whole-hearted and nobly unselfish character that he will be remembered by those among whom he laboured. Mr. Crossley was in every sense an embodiment of the altruistic idea—his life was devoted entirely to the good

of others. It would be quite impossible to give details here of all that he undertook in carrying out this idea; but perhaps the most important feature of his career was the determination he came to some years ago to give up his large establishment at Bowden, and live and work among the poor. He found in Ancoats an old music-hall called the "Star," which he purchased, and upon the site of it, and in the neighbouring streets, he built, at a cost of about £21,000, his mission-hall and dwelling-house, and afterwards a row of houses used as training homes for missionaries. There he and his wife and family made their home—labouring, without sparing themselves, for the spiritual, moral, and temporal welfare of the people round about. The Star Hall soon became the centre of a movement for a higher and more consistent standard of Christian living; and its influence has by no means been confined to the inhabitants of the immediate neighbourhood. Mr. Crossley had a somewhat delicate constitution; and there can be little doubt that his devotion to the life-work he had chosen for himself contributed to shorten the period during which that work could be carried on. He died at the Hall he had founded, where the funeral service was held last Saturday; the interment taking place in the Philips Park Cemetery.

NOTES.

Self-Intensifying Refrigeration.

Dr. W. Hampson has described in the "Engineer" his latest apparatus for the liquefaction of air and other gases by the process of self-intensifying refrigeration. This form of Hampson apparatus was exhibited at the recent *conversazione* of the Royal Dublin Society. Air at an average pressure of 87 atmospheres, not cooled in any way, was provided from an ordinary compressor such as is used for compressing carbonic acid gas. In passing through the apparatus, the temperature of the air was reduced over a range of 202° C. When a start was made with the apparatus at atmospheric temperature, the jet of liquid air was clearly seen in 25 minutes; and the liquid was being collected in the receiver 33 minutes from the start. When the apparatus was cooled down by continuous working, the liquid began to collect again in two minutes after the emptying of the receiver, and accumulated at a good rate, which, however, was not measured. The apparatus was made by Brin's Oxygen Company, and tested to a very high pressure. It is stated that, in the almost impossible event of a joint giving way, no damage can be done, since the high-pressure air exists only in the form of a thin column or thread, with very small admission passages. This is claimed to be the only apparatus existing in the United Kingdom which liquefies air without any auxiliary refrigerating agents.

Standards of Warming and Ventilation.

A movement is on foot for the furtherance of a uniform law throughout the United States for the compulsory heating and ventilating of the better class of public buildings, particularly churches, opera houses, public schools, asylums, and hospitals. Certain States have already enacted some very wise legislation in this regard; Massachusetts being particularly noticeable for the excellence of this order of sanitary laws. It is recommended, by a Committee of the American Society of Heating and Ventilating Engineers, that for all buildings, such as schools and asylums occupied almost entirely by children and youths under 15 years of age, the minimum air supply should be 1800 cubic feet per head per hour. For all buildings occupied mainly by adults, it is advised that the minimum quantity of air for ventilation should be 2000 cubic feet per hour per person. For buildings lighted in part or wholly by gas, the minimum supply of air for ventilation should be 3000 cubic feet per hour for every gas-light in use. These recommendations are reported to be supported by all the recognized American authorities on this important subject; and steps are being taken to arouse a sufficient force of public opinion all over the United States to render legislation in this regard possible and effective. Professor Carpenter, of Cornell University, is a warm supporter of this movement.

The Construction of Safe Lamps.

Some interesting observations respecting the construction of safety oil-lamps were made by Mr. Falk, of the firm of Messrs. Falk, Stadelmann, and Co., to the Petroleum Committee. He stated it to be his opinion that, if the great increase in the use of lamps and oil of recent years were considered, there would be found to be not more lamp accidents in proportion than formerly. The chief cause of such accidents he thought is the recklessness and ignorance of the public. The use of wicks too small for the tubes is another cause of accidents. Mr. Falk strongly objected to the recommendation of Mr. Spencer, of the Control Department of the London County Council, that glass containers should be abolished. Glass containers are often preferable to metal; but they ought to be made of greater strength in proportion to their size. Mr. Falk suggested as a good working rule that glass reservoirs should have a standard weight of 1 lb. for a pint capacity. Glass reservoirs have the advantage over metal of heating less and permitting the quantity of the contents to be seen. In the North of England only glass containers can be sold. To prohibit the sale of glass and china lamps would be detrimental to the lamp industry. Mr. Falk attributed the frequent breakages of glass containers to their being too light, too large, and too fragile. They would be much improved if they were made shallower than those now generally used. To double the usual weight of glass containers, and thus practically to make them safe, would not add more than ½d. or 1d. to the cost of the lamp. The Lamp Trades Association agree in the recommendation that glass containers should weigh 1 lb. to a pint. Mr. Falk also objected to Mr. Spencer's recommendation in regard to wick-tubes. These tubes have been used, but have been abandoned. They cannot be employed in round-wick lamps. Both Mr. Falk and the Lamp Trades Association think that the raising of the flash-point of the oil—say, to 100° Fahr.—would greatly reduce the number of accidents. It was also suggested that wick should be sold in short lengths of 10 inches, and stamped with its dimensions, so as to help in the selection of exactly fitting wicks.

Tornado Wind Pressures.

Mr. Julius Baier has submitted to the American Society of Civil Engineers an attempt to establish from the records of the effects of the St. Louis tornado of last year the actual pressures exerted on this occasion by the wind. The author describes the condition presented by the tornado (which, it will be remembered, wrecked gasholders and retort-houses among other structures), and analyzes some important examples of its effect. Upon the east abutment of the Eads Bridge, a rush of wind from the north-west carried away 200 lineal feet of the highway flooring, with the girders attached, and overturned both side walls for a length of 180 feet. The weight of material actually moved here by the wind was 580 tons of masonry and 280 tons of flooring and girders. Upon certain reasonable assumptions as to the manner in which the wind acted, it is deduced that at the centre of the bridge, for a distance of 150 feet, the wind must have exerted a lifting pressure of more than 43 lbs. per square foot; while at the east end of the bridge the wind must have had a force equivalent to a uniform static pressure of at least 60 lbs. per square foot over an area 180 feet long by 18 feet high. The 162 feet brick chimney of the Union Depôt Electric Railway Company was broken in two about 40 feet above the ground, and the upper part overturned. This chimney was built of hard-burnt bricks set in a mixture of portland cement and lime mortar. It was computed that, in order to move the mass of 321 tons of brickwork thrown down, the wind must have exerted a force of more than 85 to 91 lbs. per square foot over an area at least 14 feet wide and 110 feet high. A striking fact noted throughout the work of clearing away the wreckage was the superiority of riveted to bolted connections when the joints are subjected to bending, twisting, or wrenching strains. For straight pulls, the bolts answered fairly well; but twisting was fatal to them. Where riveted beams were twisted, on the contrary, the rivets still held in many instances, and had to be cut out. The endurance of the riveted work in both iron and steel under destructive strains strongly impressed Mr. Baier. Generally, he found that for lofty structures it is prudent to recognize the possibility of wind pressures of 30 lbs. per square foot of the exposed surface, with 50 lbs. per square foot upon the extreme upper portions.

Galvanized Wrought-Iron Water-Pipes.—According to reports from a number of American Water Companies, the objections raised on sanitary grounds against galvanized wrought-iron pipes have no foundation; and the researches of Ruoff have shown that the amount of zinc dissolved by water during an exposure of eight months is so minute (0·0024 gramme per litre) that it may be regarded as not being injurious to health.

Proposed "Victoria Research Fund."—A meeting of Presidents of various scientific societies in London was recently convened by the President and officers of the Royal Society, to consider whether any, and if so what, steps should be taken to commemorate the sixtieth year of Her Majesty's reign. It was unanimously resolved—"That a fund, to be called the Victoria Research Fund, be established, to be administered by representatives of the various scientific societies, for the encouragement of research in all branches of science." The President of the Royal Society has communicated this resolution to the scientific societies, with a letter asking whether support would be given to it.

Coal-Tar Dye Stuffs for Colouring Edibles.—The effect on digestive ferments of four coal-tar colouring matters known to be employed for the purpose of colouring confectionery—viz., fast yellow, saffoline, magenta, and methyl orange—has been studied by Mr. H. A. Weber; and the results of his investigations have been communicated to the "Journal of the American Chemical Society." The experiments were made with pepsin and pancreatin; blood fibrin being digested with the ferment and hydrochloric acid, and parallel tests made with and without the addition of the colouring matter. It was found that acridine red, magenta, and methyl orange do not interfere with the action of pepsin, but considerably retard that of the pancreatic ferment; while in the case of fast yellow the exact reverse takes place. Since all these colours retard the action of one or other of the digestive ferments, they are unsuited for the purpose of colouring articles of food and drink.

TECHNICAL RECORD.

NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

Annual Meeting at Boston.

The Twenty-seventh Annual Meeting of this Association was held on the 17th and 18th ult., under the presidency of Mr. C. D. LAMSON, of Worcester (Mass.).

The President, in the course of his address, said the sales of gas during the last year showed a very satisfactory increase; but there was some falling off during the last two months of the year in the demand for gas sold for business and manufacturing purposes, in sympathy with the pause in business operations that had followed the election in November. Several periods of depression during late years had led to caution in the expenditure of new capital; but he believed many gas undertakings were now in such a position that extensions could not be longer delayed. There was an increase of price for naphthas and gas oils during the early part of the year; but ironwork and construction had been very low. It was well to remember that the price of iron, however, was quietly but steadily rising. While they had been free from strikes or other special troubles in business, the Legislature had given them a great deal of care and anxiety. Of late years, the income from the sale of coke had been small; and unless there was a water-gas plant or electricity works to take a large portion, there was difficulty in disposing of it. The cause of this was the abundance of cheap though inferior semi-bituminous coal. The tar market had been very irregular; and endeavours were being made to get a fair duty put upon imported tar. Ammonia had suffered by the competition of coke ovens. There was a steady increase in the use of gas-stoves, and also in the introduction of incandescent gas lights. A great deal was claimed on behalf of acetylene and calcium carbide a year ago; but practical experience showed there were many objections, and it was doubtful if this substance would prove of much use to gas engineers. In America, the adoption of the prepayment meter had been slow; and the Consolidated Gas Company of New York were probably the first to take it up. The initial outlay was large; and he did not favour the English plan of putting an increased charge on the gas to cover this. Manufacturers believed there would eventually be a large trade in these meters. As regards gas-engines, many improvements had lately been introduced; and the future looked very hopeful. Some reference was made to the state of gas affairs in Boston; and the "Whitney" Bill was denounced in strong terms. The recent agitation against water gas, or in favour of restoring the old 10 per cent. of carbonic oxide limit, was reviewed at length; and an historical summary of the introduction of water gas in America followed. The President spoke strongly in favour of water gas, as having proved beneficial to all concerned. A larger number of casualties than usual had led to a demand for more safety in the use of gas; and the subject was now under the consideration of the Committee on Manufacture.

The first business after the address, was the passing of memorial minutes to the late Mr. J. R. Thomas and Mr. Gideon Wood. After electing officers for the ensuing year, the report of the Committee on Day Output was presented. A form had been issued to the members, asking for a return of the gas supplied during each 3 out of the 24 hours, based on a fair average, both for summer and for winter output; and inviting suggestions as to a uniform practice for defining "day consumption." Only nine of the replies showed a separate record of gas sent out in the daytime. There were many different definitions of day consumption. Some took it as 6 a.m. to 6 p.m. all the year round; some followed sunrise to sunset; and others estimated day consumption as gas used for purposes other than lighting. The Committee, however, regarded it as gas taken at a time other than during the heavy draught of the ordinary lighting hours; thus enabling the same plant to turn out more gas. The Committee recommended that a separate account of the day consumption should be kept, taking the following as a basis:—

April 1 to Oct. 1	6 a.m. to 6 p.m.
Dec. 1 to Feb. 1	8 a.m. to 4 p.m.
Remainder of year	7 a.m. to 5 p.m.

Or 8 a.m. to 4 p.m. might be substituted for the whole of the six winter months. After several members had spoken as to the advantages of keeping an account of the consumption during the various hours of the day and night, the recommendation of the Committee, substituting 8 a.m. to 4 p.m. for the six winter months, was carried.

A paper on the "Extraction of Ammonia from Spent Oxide" was read by Mr. Carl Graf, of Laurence (Mass.). The process recommended consisted of placing the oxide to be treated in a suitable vat or tank, adding boiling water sufficient to well cover it, and drawing off the liquid after five or six hours. The ammonia extracted was principally in the form of sulphate or chloride. Therefore the hydrometer or saturation tests were of no use; but it must be distilled with excess of alkali. The author obtained results sufficiently accurate for practice by mixing milk of lime with the liquor, allowing it to settle, decanting off the clear liquor, and applying the acid test. He had obtained as much as 9 gallons of 10-oz. liquor per bushel of oxide; and he found that, though one washing would not extract all the ammonia, about 8 gallons of water per bushel of oxide would extract so much that a second washing would not pay. Oxide that had been in use for eighteen months gave 4·3 gallons of 10-oz. liquor per bushel; and some that had been employed for about a year, gave 3·2 gallons. He found by experiment that 10-oz. liquor required 0·6 lb. of lime per gallon to displace the ammonia, and other strengths in proportion. To treat 100 bushels of oxide, meant a labourer half a day, and about 1 cwt. of coal for boiling the water.

Mr. W. H. Snow, of Holyoke (Mass.), followed with a paper on "Gas Distribution," in which he enlarged on the necessity for close supervision, and the maintenance of regular pressures throughout the district. He advocated wrought-iron mains in place of cast-iron. They could be made absolutely gas-tight; and if they did not last so long as cast iron, a great deal could be done in the way of making them durable. If services could be protected by varnishing, &c., why not mains also? Up to 4-inch size, there was no difference in cost; but for 6-inch, 8-inch, or 12-inch mains, wrought iron would cost 30 per cent. or so more. The average loss of gas per mile of main per annum, according to official returns, was 150,000 cubic feet; and if this could be reduced to practically nothing, the money would be well spent. He preferred wrought iron to steel; and he was not going on theory only, as he laid about a mile of 3-inch wrought-iron main twenty years ago, and it was still in good condition. Speaking of joints, he expressed a strong preference for lead as compared with cement. With the dangers of electrolysis in view, a non-conducting pipe offered great advantages; and he asked if any member had tried the newly-introduced "fibre" pipe. Stopcocks placed on service-pipes were scarcely necessary; but he was strongly in favour of some systematic arrangement of valves over the whole of the mains. Dealing with naphthalene, he ventured the theory that pressure had something to do with this deposit, as experience showed that it was small overworked systems that gave the most trouble.

In the course of the discussion, Mr. M'Kay instanced a run of over a mile of wrought-iron pipe that, to his knowledge, had remained absolutely tight for ten years. There were expansion joints about every 500 feet. Mr. Gifford thought that a slight shock—such as that offered by a diminution in the size of the pipe—frequently proved sufficient to determine the precipitation of naphthalene. Captain White knew of about 3 miles of fibre pipe that had been laid for two years or more—some of it for unpurified gas; and so far as could be judged, it was sound and entirely satisfactory. In another case, 3000 feet of 10-inch pipe had been laid for conveying water, mostly in the open; and this was as good as new after a year's use. But he found that a piece of the pipe—it was made of paper treated with bitumen—was entirely disintegrated by soaking in a bucket of ammoniacal liquor for a week. The Standard Gas Company of New York had laid a great deal of wrought-iron main-pipe during the last ten years. He had seen the trenches opened many times; and he believed that, when properly laid, it was as durable as cast-iron pipe. He agreed that wrought-iron was better than steel pipe. Mr. Lane had had ten years' experience with steel mains, with ball-and-spigot lead joints; and they worked very well. The Secretary remarked that the Subway Commissioners of Brooklyn had found that cast iron was less liable to the effects of electrolysis than wrought iron. Mr. Woodward said that, with cement joints, it was assumed that if there was no evident leakage, they were sound; but in his experience, they would not stand a test of 2 lbs. per square inch. He went on to advocate periodical pressure-taking all over the system of mains, so as to find out weak places; and he stated he had used a recording gauge for this purpose with great advantage. He had all wrought-iron pipes on the works, and his purifiers were also made of wrought iron; but he had not tried it outside. The President said he had laid 4 miles of 30-inch main with cement joints; and it proved perfectly sound under pressure.

Mr. F. C. Sherman next presented a report from the Committee on "Naphthalene," in which it was stated that the admission of naphtha vapour to the gas at the outlet of the holder was being tried by many gas engineers, with apparently very satisfactory results.

A paper on "Temperature" was read by Mr. W. E. M'Kay, of Boston, who referred to "King's Treatise on Coal Gas" as an authority for the statement that the thermometer ought to be freely used in a gas-works, and quoted from several papers in proof of the fact that "temperature" was a very important item in the economy of gas manufacture. He then treated of temperature as affecting the proportion of aqueous vapour present in a gas. It was a mistake to make the connections of the same area throughout, from the hydraulic to the holder. With 12-inch connections for the gas after the purifiers, a crude gas at the temperature of 183° Fahr. should have a 20-inch main to ensure an even rate of flow. M. Bremond and others had pointed out the advantage of removing aqueous vapour from the gas; but it must be remembered that dried gas would take up its equivalent of aqueous vapour, according to the temperature, if brought into contact with water, as in the gasholder. At the Calf Pasture station, Boston, at the maximum rate of make, the gas was only five minutes passing from the generator to the holder; being condensed, washed, purified, and measured in this period. Systematic thermometer readings were taken at all points. To the well-known apothegm might be added: "Candle power may

be made in the retort-house, but lost in the condenser." In addition to the gas, the thermometer was useful in connection with feed water to boilers, superheated steam, chimney gases, &c. The paper was illustrated by an exhibit of thermometers of various kinds; the special application of each being explained by the author.

Mr. Gifford opened the discussion by emphasizing the importance of temperature in the gas-works; and he said that the simpler the instrument used, the better. A plain tube put through a cork would answer many purposes. Mr. Boardman said there was a close relation between this paper and the one preceding it, in that one treated of temperature and the other of pressure. They should all look very carefully after pressures and temperatures. Mr. Fowler had experienced great advantage by enlarging his connections throughout; thus giving the gas more time between the condenser and the gasholder. Mr. Addicks thought the point of the paper would be lost if the members did not apply it in practice. The table of aqueous vapours would be very useful in connection with loss by leakage. He hoped several members would bring forward something definite on these points next year.

Mr. M'Kay, in reply, said that the controlling temperature, so far as condensation was concerned, was the temperature of the gas at the outlet of the holder. There was no use getting it much lower than this point; but it should be brought down as near as possible, so as to secure precipitation of everything that would be likely to be deposited in the holder or mains. He explained how the fall in temperature experienced by gas in passing through a certain length of pipe, could be calculated by measuring the quantity of water deposited.

A paper entitled "Some Remarks on Coke-Ovens and their Products," was read by Mr. S. J. Fowler, of Springfield (Mass.). After noticing the claims of the recent scheme for manufacturing coke on the sea-board and distributing cheap gas all over the State, and the old-fashioned or beehive form of coke-oven, the author gave a detailed description of the Semet-Solvay coke-oven, as in use at the works of the Solvay Process Company, at Syracuse (N.Y.). Viewed as a gas-making plant, he showed that it was inferior, from an economical point of view, to ordinary gas-works apparatus. The first cost was not less; and the ground space required was 50 per cent. greater. The gas from the coke-oven was very inferior as compared with ordinary coal gas; and the yield was only about one-third. He concluded by quoting some figures, showing that coal gas should be sold at 1s. per 1000 cubic feet to compete with coal for general heating; and coke-oven gas, at something less.

(To be continued.)

MICHIGAN (U.S.A.) GAS ASSOCIATION.

Annual Meeting at Ann Arbor.

The Fourth Annual Meeting of this Association was held on the 17th ult.—under the presidency of Mr. W. M. Eaton, of Jackson (Mich.). As usual with this Association, portions of the proceedings were withheld from publication, including the Inaugural Address on this occasion. The following particulars are abstracted from the "American Gaslight Journal."

A paper entitled "One Method of Placing Gas-Stoves and Welsbach Lights" was read by Mr. L. M. Latta, of Goshen (Ind.). The system alluded to consisted of the alternative plan of fixing the stove *gratis*, or charging it at list price and giving a free receipt for about £5 5s. worth of gas. The latter was preferred, as people took it as a reflection to accept a stove; and 29 stoves were fixed. The average consumption was 32,400 cubic feet of gas per stove per annum; and the total outlay was under £100, as there was the profit on the stove to go against the free gas. He was well satisfied with the result, and was about to extend the plan to 3-burner hot-plates. The first experiences with Welsbach lights were unsatisfactory; and he had now adopted the plan of supplying them at a contract price per lamp, inclusive of maintenance and renewal. His price was 4s. 2d. per lamp per month; and after deducting all expenses, interest on investment, &c., there remained more than sufficient to pay for the gas used at current rates.

The President said that in Ann Arbor he undertook the systematic inspection and maintenance of Welsbach lights at fixed rates ranging from 5d. to 10d. per lamp per month, according to circumstances; and he exhibited a copy of the agreement form he used. Mr. H. D. Walbridge quoted some comparative tests he had made. A Welsbach burner, with gas at 4s. 2d. per 1000 cubic feet, would furnish a light equivalent to 84 candles at a cost of 0·15d. per hour. A good average oil-lamp would furnish a 30-candle light for 0·48d. per hour; and one of the best oil-lamps obtainable gave a 37-candle light for 0·54d. per hour. This was with kerosene at 6d. per gallon. After allowing for mantle renewals, &c., the Welsbach burner was four times as cheap as the oil-lamp.

Mr. L. E. Walker, of Lansing (Mich.), contributed a paper on "Snags," dealing with minor difficulties and worries that occur in regular working at a gas-works. After touching upon leaky mains, frozen services, and the troublesome gas consumer, he referred to difficulties incidental to the incandescent light caused by carelessness, or the breakage of mantles due to vibration, jar of slamming doors, &c. Another trouble was the ignorance of servants who came in from the rural districts. This rendered it necessary for him to have special cards printed for attachment near gas-stoves, urging the necessity of turning off the gas when not in use.

Several other topics were briskly discussed by members.

CORRESPONDENCE.

[*We are not responsible for the opinions expressed by correspondents.*]

Carburetted Water Gas.

Sir,—After the obviously unsatisfactory reply of Mr. Stelfox contained in your issue of the 23rd inst., nothing remains for me but the objection raised by him to my item of "repairs in retort-house," and its equivalent in water gas manufacture of "wear and tear." Omitting interest on machinery (which was included in the 0·75d. objected to), actual repairs in the retort-house at Elland for the year 1896, amounted to 0·29d. per 1000 cubic feet of gas made, which compared with "wear and tear" for water gas manufacture at Belfast of 0·18d., leaves a difference of 0·11d. only, instead of 0·50d. allowed in the table referred to.

It must be a matter for general regret that Mr. Stelfox should deem it expedient to dismiss this discussion at such an interesting stage.

Elland, March 27, 1897. Robert Porter.

Frith Hill, Godalming, and Farncombe Water Company.—The Directors of this Company have awakened to the fact that they have been following a policy of false economy. The Company have had an existence of some 20 years; and in 1895 they only paid a dividend of 2 per cent. The secret of this appears to be that they have been trying to work with old machinery; and consequently the expenses have been abnormally heavy. Now, however, they have taken the advice of experts, and are putting down new works. The capital required for this purpose was readily subscribed; and the new plant is in an advanced state. The shareholders were gratified, at their meeting a few days ago, to find the Directors were able to recommend a dividend of 3 per cent.; and it is to be hoped this is an augury of what is going to be done in the future.

Arbitrations as to Water Rights at Ilkley.—At an arbitration held at Ilkley in January last (as reported at the time), the Governors of the Skipton Grammar School sought to sustain a claim against the Ilkley District Council for £1034 for water rights which the latter wished to acquire. The valuation of the Council was £37 7s. 11d. The Arbitrators (Messrs. J. Smith and C. Hargreaves, of Bradford) have been unable to agree; and consequently the matter was submitted to the Umpire (Mr. Thomas Winn, of Leeds), who has given his award as £650 12s. 6d., and directed that the promoters shall pay the taxed costs of the claimants. Another matter arising out of the same circumstances was submitted to the same arbitration court; the claimant being Mrs. Ann Wall and her trustees, who also claimed in respect of water rights on Addington Moor. The claimants' valuation in this case was £237 15s.; and that of the Council, £4 8s. 6d. Prior to the case being considered, the Council offered £50 in settlement, which was refused. The Umpire awards £189 12s. 6d., with taxed costs.

Armagh Gas Company, Limited.—Notwithstanding a reduction of £210 in the second half of the past year, the gross balance on the revenue account of the above Company for the past twelve months was only about £80 less than it was in 1895; and the net balance available for division at the annual meeting on the 15th inst. was £1038. The Directors therefore recommended the payment of the usual dividend of 2s. per share, free of income-tax. This would absorb £1880, and leave £158 to be carried forward. The Company's Engineer and Manager (Mr. J. Whimster) reported that the works had been maintained in a state of general efficiency; and that there were more than 40 prepayment meters in use. The Chairman (Mr. J. Prentree) moved the adoption of the Directors' report; and it was carried. The dividend recommended was then declared. A cordial vote of thanks having been passed to Mr. Whimster, he, in responding, acknowledged the hearty co-operation of the Directors, without which, he said, a manager could not do anything. He expressed his gratification at the Company having succeeded in reducing the price of gas. Ten years ago they made their first reduction from 5s. to 4s. 7d.; and now they were down to 3s. 9d. and 3s. 4d., and no meter-rents were charged. If the difference in these rates was totalled up, it would be found that close upon £1500 a year had been saved to the public by the last reduction.

The Chester Gas Company and the Public Lighting of the City.—The action of the Chester Gas Company in raising their terms for the public lighting of the city, noticed in a paragraph in the "Journal" last week, was very sharply criticized at the meeting of the Town Council at which the matter was considered. This led the Secretary of the Company (Mr. J. Pye) to send to the local Press a statement of facts and figures which in some measure mitigates the effect of the strictures passed upon the Directors. Mr. Pye points out that the street lighting of the city was undertaken in the past on exceedingly moderate terms in consideration of the monopoly enjoyed by the Company. But seeing that the Corporation, by the introduction of a rival illuminant, have at one stroke deprived them of their most lucrative source of income—the lighting, both public and private, of the centre of the city—it is too much to expect that they will be able to continue the magnanimous terms hitherto given to the ratepayers. The policy of the Company has been characterized as "suicidal." This they utterly repudiate. Under the old conditions, they could afford to act liberally towards the Corporation; now, however, they find themselves compelled to put the public lighting on a paying basis. With regard to the assertion, which was reproduced in the "Journal," as to the cost of the 4-feet burners being increased by £228, Mr. Pye ridicules the statement; the actual figure being, according to his estimate, something like £68; and when certain large gas-lamps are thrown out of use, as they shortly will be, to make way for electricity, he considers that a reduction o about £140 will be effected in the city's gas bill.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

The following further progress has been made with Bills:—

Bills brought from the Commons and read the first time: Dumfries and Maxwelltown Water Bill, Huddersfield Corporation Bill.

Bill read a second time and committed: South Metropolitan Gas Bill.

Bill rejected: Caerphilly Urban District Council Bill.

Bills reported, with amendments: Cowes Gas Bill, Harrogate Corporation (Water Transfer) Bill, Loughborough Corporation Bill, Lowestoft Water and Gas Bill, Malvern Link Urban District Gas Bill, Tynemouth Corporation (Water) Bill, Tynemouth Gas Bill.

Bills reported without amendment: Crays Gas Bill, South Metropolitan Gas Bill.

Opposition withdrawn: Hunstanton Water and Gas Bill.

Bills read the third time and passed: Harrogate Corporation (Water Transfer) Bill, Harrogate Water Bill, Newport Corporation Bill, St. Anne's-on-the-Sea Gas Bill, Taunton Gas Bill.

HOUSE OF COMMONS.

The following further progress has been made with Bills:—

Bills read the first time and referred to the Examiners: Harrogate Water Bill, St. Anne's-on-the-Sea Gas Bill, Taunton Gas Bill.

Bills reported: Ashford Gas Bill [parties do not proceed], Ashford Urban District (Gas) Bill, Perth Improvements Bill.

Bill read the third time and passed: Huddersfield Corporation Bill.

Mr. Campion, the Examiner who had before him last Friday the petition for the Southwark and Vauxhall Water Bill, which has been deposited under circumstances already alluded to, has reported that the Standing Orders in respect thereof have not been complied with; and his report has been referred to the Standing Orders Committee.

The East Warwickshire Water Bill, the Newark Corporation Water Bill, the Nottingham Corporation Water Bill, the St. Neot's Water Bill, the Swadlincote District Gas Bill, the Tuxford and District Gas Bill, and the Weymouth Water Bill have been referred to a Select Committee, consisting of Mr. J. A. Campbell (Chairman), Mr. Emerson Bainbridge, Mr. J. G. A. Baird, and Captain C. W. Norton; to meet on Tuesday, March 30.

The recent decision of the London County Council to proceed with the plans and sections of the Wye portion of their Welsh water scheme, at a cost of £1500, notwithstanding the rejection by the House of the proposal that the Council should acquire the control of the water supply of London, was brought under the notice of the President of the Local Government Board (Mr. Chaplin), on Monday last week, by Sir F. Dixon-Hartland, who asked whether any steps could be taken to prevent this expenditure of the ratepayers' money, and whether the parties promoting the scheme could be surcharged by the Government or other Auditor. Mr. Chaplin said the expenditure in question was considered to be authorized by section 3 of the London Water Act, 1892. The Local Government Board had no authority to intervene to prevent it; and it would, of course, devolve on the District Auditor, as in the case of any other payments by the Council, to consider whether or not it had been legally incurred.

HOUSE OF LORDS COMMITTEE.

Monday, March 15.

(*Before Lord* Poltimore, *Chairman, the Marquis of* Bath, *Lord* Colchester, *Lord* Ampthill, *and Lord* Aberdare.)

HARROGATE CORPORATION (WATER TRANSFER) BILL.

This measure was considered by the Committee after they had disposed of the Lowestoft Bill, reported last week.

Mr. Balfour Browne, Q.C., and Mr. Mackenzie represented the promoters; and Mr. Pember, Q.C., Mr. J. D. Fitzgerald, Q.C., and Mr. Claude Baggallay appeared for the Harrogate Water-Works Company, who opposed the Bill.

Mr. Balfour Browne stated that the Corporation had not withdrawn their opposition to the Harrogate Water Bill.

Mr. Baggallay said the Bills were not competing Bills.

The Chairman: We will take the Corporation Bill first.

Mr. Balfour Browne then proceeded to address the Committee for the promoters. He said the Bill was for the purchase of the works of the Harrogate Water Company. Harrogate, as their Lordships knew, was a place of considerable repute for its mineral waters. It was incorporated by Charter in 1884, and was frequented by a very large number of visitors. Its mineral wells had been celebrated for over 200 years. One of these wells was called Pee-wit Well, a curious old survival, because it was a well which used to be frequented by a large number of lapwings. This well was discovered by Sir William Gregory, who had become acquainted with the German mineral springs; and it had appeared to him that the waters here were similar to those on the Continent. In 1841, there was an important Act which empowered the Water Company to spend £3000; and in 1862, a railway station was made in the very centre of the town. After the erection of this station, there was such a marked increase in the prosperity of the place that now the population reached 17,000. Round about Harrogate—and this accounted for the great success of the place—there were a number of large centres of population, such as Leeds and Bradford; so that it might safely be said that within a radius of twenty miles there was a population of over one million. In 1864, the population of the town was only 4000; in 1881, it had increased to 9400; in 1891, to 13,917; and it had now increased to between 17,000 and 18,000. The rateable valuation of the town, which in 1841 was £17,000, was now £118,000; the area of the borough was 1287 acres; and the rates were 3s. 2d. in the pound. Everything that was possible was done by the Corporation to attract visitors to the place. The total indebtedness of the town was £215,693; and the whole of this would be extinguished in 27 years. One of the conditions of the transfer of this undertaking from the Company to the Corporation would be that the rate charged would not be greater than that which was levied by the existing Company. A sinking fund would be established, under which the works would, in 40 years, become the absolute property of the Corporation, and no longer would interest be charged upon capital. The Corporation owned considerable estates in the town; and in this case, unlike the last which the Committee had had to consider, there was nothing insanitary which could be charged against the Corporation in the management of the affairs of the town. In respect to Harrogate, the time had come when the transfer of the works should be made—always, of course, on fair and liberal arbitration terms. The Company were, and had been for some time, receiving their full maximum dividend. They were exercising all the powers which Parliament had given them; and they could not do any more. If they were bought up now, they would be purchased in possession of their maximum dividends. The question of the right of the Corporation to supply water had risen; and he argued that, where a water company could not supply sufficient water to meet all the demands of a corporation, that corporation had the right to supply themselves. The Harrogate Company had reached the end of their tether—they could not continue to supply a sufficient quantity of water to meet all requirements; and in the Bill the Company were now proposing, they sought from Parliament powers to enable them to construct a whole set of new works. He, on behalf of the Corporation, asked that this permission should be refused, and the Corporation be allowed to supply themselves. Everybody in Harrogate was in favour of the Corporation supplying the water. The Corporation themselves were unanimous; and so were the ratepayers.

Mr. Claude Baggallay pointed out that the Corporation sought to do more than the Company desired in their Bill to do.

Mr. Balfour Browne then went through the petition of the Water Company; making reference to its principal points. The petitioners, he said, claimed to have "faithfully fulfilled their statutory duties and obligations;" and to "have afforded an efficient supply of excellent water at a reasonable price." They said: "No serious complaint has ever been received, either from the consumers or the Corporation, or any other local authority." No doubt, they had fulfilled their parliamentary duties; but they had got their parliamentary reward. They came now and asked for powers for an entirely new scheme; and his contention was that this new scheme should be entrusted to the Local Authority. The Company said: "Your petitioners submit that the successful management of their undertaking justifies them in alleging that no advantage would accrue to the consumers by a transfer thereof, from a body intimately acquainted by a long experience with the requirements of the whole of the large area within their limits of supply to the Corporation, who can claim no such experience, and who have already a large number of duties to discharge and undertakings to attend to"—surely, the same might be said of Manchester, Liverpool, Birmingham, and other places—"and who would, if the Bill be allowed to pass, obtain the control of the water supply not only of the borough, but of the large area outside." The "large area outside" spoke for itself in this matter. It was not opposing the Bill. The petition went on to say that the Corporation would have a direct inducement to prefer the interests of the borough to those of the outside area; but this was answered by the remark he had just made. Then the petitioners said: "The Corporation, besides numerous duties of a municipal and sanitary authority, have a large establishment for bathing purposes, and for dispensing numerous mineral waters under their control; and in connection therewith they contemplate a further expenditure of capital in the purchase of lands containing or adjoining mineral springs." This was one of the strongest arguments for the Bill. The wells were in the hands of the Corporation for medicinal purposes; and they should be similarly situated in regard to the supply of plain water, a large quantity of which was used in their baths. The petition continued: "With a view to meeting the requirements of the increasing population of the district within their limits of supply, your petitioners are promoting a Bill in the present session of Parliament to enable them to construct an additional reservoir and waterworks." This was the ground for the Corporation urging Parliament not to let the Company do this, but to allow them (the Corporation) to carry out the new works for the reason that they could do so more cheaply, and more to the advantage of the ratepayers. In regard to the proposed works, the petitioners said: "These works are urgently required to meet the growth of the population, more especially outside the borough; and from the fact that the Corporation are not proposing any new works or means of increasing their supply, it would appear that they intend to disregard the interests of the outside area. Your petitioners submit, and are prepared to show, that the proposed works are essential to the maintenance of a sufficient supply to their consumers; but, nevertheless, the Bill of the Corporation makes no provision for carrying out those works or for raising the necessary moneys for that purpose." In reply, it was simply necessary to say that the Corporation were prepared to carry out the works contemplated by the Company. The latter would get the full value of their undertaking; but the Corporation said, "Do not let them start a new supply."

Mr. *J. H. Wilson*, Mayor of Harrogate, and member of several scientific societies, was the first witness called for the promoters. He gave facts as to the material growth of the town of late years; stating that in the season the population would, at times, reach as high a figure as 60,000. Harrogate competed in a great measure with the German Spas; and its waters found greater favour with medical men year by year. For the comfort of the visitors, the Corporation were anxious to do all they could. The medical men of Harrogate—some 50 in number—almost unanimously favoured the Bill. It was especially to be desired that, in a health resort like Harrogate, the Corporation should have the control of the water supply. Confidence in the place by the outside medical faculty would be increased; and it would enable the drains of the town to be more completely flushed. Under the Bill, the Water Company would be treated with the greatest fairness; and bearing in mind that the town was able to raise the necessary capital at 3 per cent., and that an extension of the waterworks costing between £70,000 and £100,000 was necessary, it was thought that the new scheme should be carried out by the ratepayers,

and that the present was the proper moment for the transfer of the undertaking. He understood that the Directors of the Company met, as a rule, in London. In regard to protection from fire, the present arrangements were deemed insufficient.

Cross-examined by Mr. BAGGALLAY: The water supplied by the Company was deleteriously affected by leaden pipes, and gave rise to plumbism; and an endeavour should be made, by whatever authority had the control in future, to remedy this evil. The Corporation first drew the attention of the Company to this matter in October, 1895. Though, as he had stated, the Corporation could raise the new capital at 3 per cent., yet if the Corporation raised the amount necessary for the construction of the new water-works, the ratepayers would have to pay about 7 per cent. on it in the end. He could not say the rate at which the Company could raise the money.

The CHAIRMAN: Surely, Mr. Baggallay, you do not contend that a Company is able to raise money at as low a rate as a Corporation.

Mr. BAGGALLAY: Very nearly, under the auction clauses.

Witness (continuing) stated that the question of purchase was considered by the Corporation before the Company promoted their Bill.

Re-examined, witness said that several attempts had been made on the part of the Corporation to meet the Directors of the Company to discuss the subject of purchase; but the latter had always refused to enter into negotiations.

Mr. *Charles Gott*, M.Inst.C.E., of Bradford, said his acquaintance with Harrogate extended over many years; and he had specially visited the town, and made particular investigations in view of the present proceedings. Harrogate was situated in a hilly district, and had the advantage of a water supply by gravitation. He had given consideration to the question of the right of the Corporation to purchase the water undertaking; and it was his opinion that, as the Company had now exhausted the whole of their statutory powers, dating from 1846, and were seeking new powers for constructing further reservoirs and works, the public advantage would be served by the transference of the water supply to the Corporation. The present moment was a most favourable one for the transfer; and the inhabitants of Harrogate would get the full advantage of it, if the Corporation were allowed to undertake the supply. The inhabitants would benefit for the reason that, in all cases of supply by gravitation, there was an excess of water, which the Corporation could make valuable use of for the sanitary purposes of the borough, but which would be allowed to run to waste by the Company.

In cross-examination by Mr. BAGGALLAY, witness said that, generally speaking, he favoured handing over to the local authority the control of the water supply.

Mr. *W. H. Wyles*, Town Clerk of Harrogate, said that the population of the town was 18,500; but during the past season, 200,000 tickets were sold to persons desirous of drinking the waters. The Corporation owned estates, which would become their freehold property in 27 years, and the value of which, in his opinion, was double the debt of the borough. The town was practically unanimous in favour of the proposed transfer. It was proposed to treat the Company liberally, and give them a full and fair price for their undertaking.

Cross-examined by Mr. BAGGALLAY: He had made inquiries as to whether the Directors of the Company were prepared to name a price at which they would sell. The reply received was in the negative. The Corporation did not think this was the right way of going to work. He had never tried to buy the water stock of a going concern by auction; but he would certainly give less for stock sought to be created than for that which existed at present.

Re-examined by Mr. BALFOUR BROWNE: The new works, to be carried out at a cost of £100,000, would be more or less a speculative affair; whereas the existing stock realized a high dividend, and would fetch a large premium. He had no doubt that the Corporation would be able to raise the new capital at a lower rate than the Company.

Mr. *Gainsford*, Chairman of the Water Committee of the Sheffield Corporation, gave evidence to the effect that the purchase of the water undertaking by the Sheffield Local Authority had been of great advantage to the public from a financial as well as a sanitary point of view. It had not been necessary to go to arbitration in the Sheffield case, though the amount involved was two millions. He did not know of a case in which it could be more desirable that the local authority should have the control of the water supply than that of Harrogate.

This concluded the case for the promoters.

Mr. FITZGERALD, in a brief address on behalf of the Water Company, submitted arguments in support of the petition of his clients. He pointed out that the Company had given general satisfaction to the consumers and the public for over thirty years; that the quality of the water had been excellent; and that no complaint was made until 1895, when plumbism was for the first time referred to by the Corporation. There had been no difficulty or friction between the Corporation and the Company; and he submitted that, unless it was to be seriously contended that a corporation had a right to step in and take possession of a company's undertaking directly they had expended their original capital and proposed to go to Parliament to raise more money in order to carry out an extension of works, there was no justification for the claim of the Corporation.

The room was cleared; and on the re-admission of the public,

The CHAIRMAN announced that the Committee were unanimously of opinion that the Bill should proceed.

Tuesday, March 16.

TYNEMOUTH WATER BILL.

This Bill, promoted by the Tynemouth Corporation, seeking powers to acquire the undertaking of the North Shields Water Company, was before the Committee to-day.

Mr. PEMBER, Q.C., Mr. PEMBROKE STEPHENS, Q.C., and Mr. PAGE appeared for the promoters; Mr. BALFOUR BROWNE, Q.C., and Mr. G. A. R. FITZGERALD, for the North Shields Water-Works Company; Mr. WORSLEY TAYLOR, Q.C., and Mr. CLAUDE BAGGALLAY, for Earl Percy; Mr. FREEMAN, Q.C., and Mr. A. J. RAM, for the Newcastle Corporation; Mr. RAM, for the Tynemouth Rural District Council; and Mr. J. D. FITZGERALD, Q.C., and Mr. WHITEHORN, for the Whitley and Monkseaton District Council.

Mr. PEMBER, in opening the case for the promoters, said this was a proposal to buy the various works and interests of the North Shields Water Company, at present supplying water to the borough of Tynemouth and portions of the immediate neighbourhood. The entire area supplied by the Company contained a population of 56,000 people, of whom about 50,000 were resident within the borough of Tynemouth. The quantity of water supplied by the Company was insufficient; and the water was also lacking in quality. The Company were not in a position to meet the great and growing demands of the district generally, and more particularly of the borough of Tynemouth. The financial position of the Company was also unsatisfactory. No dividend had been paid for many years until last year, when one of 2½ per cent. was declared. Under these circumstances, the Corporation felt that the time had arrived when the Company should be set aside. The Company had never been successful; their credit was bad, and the supply of water inefficient; they were wanting in energy; and they had always been more or less in the market. The Corporation were, therefore, practically unanimous in favour of acquiring the undertaking; having passed a resolution to this effect by a majority of 20 votes to 2. At present the supply for all purposes amounted to 17 gallons per head per diem; and no supply was afforded for streets and sewers, for the flushing and washing of which the Corporation had to make use of sea water. A supply of at least 25 gallons per head of the population ought to be provided; and if such a supply were given at the present moment, a deficiency of 450,000 gallons a day would have to be met. Ten years hence, supposing the population continued to increase at the present rate, the deficiency would amount to 750,000 gallons a day—leaving out of the calculation the summer visitors, who were an increasing number. Of course, the Company must be extinguished on fair terms. If the supply was taken at 25 gallons a head per day, the Company had only 42 days' storage. There was only one Director of the Company who resided at Tynemouth; and they had no specific Engineer of their own. He pointed out that several of the petitions against the Bill, it was understood, would not be proceeded with—namely, those of the Whitley and Monkseaton Urban District Council, the Merton Rural District Council, the Gateshead Corporation, and the Water-Works Company. Earl Percy, he believed, was persevering with his petition, as also were the Tynemouth Rural District Council and the Newcastle Corporation. With regard to the latter, the learned Counsel questioned the *locus standi* of the petitioners. Dealing in detail with the petition, he pointed out that in the early paragraphs, the petitioners stated what they were and what they possessed, and what their interest was. Then they went on: "The said city and its inhabitants and your petitioners will be injuriously affected by the Bill, which relates to the water supply of the said city and the other places in which, as before-mentioned, your petitioners are large owners of property; and they object thereto." The supply, he submitted, would not be affected in a single case. The petitioners set forth where the water was obtained; and their statements were quite accurate. They said that the North Shields Company, on the Newcastle Company's Storage Bill of 1894, petitioned against any alteration being made which would increase the statutory restrictions upon the supply of water to the North Shields Company by the Newcastle Company. This was quite true; but it had nothing to do with the present measure. The statutory restrictions on the supply of water were detailed; but that, again, had nothing to do with the Bill. In clause 12 of their petition, they said: "The power sought by clause 25 would enable the Corporation to obtain water from the Newcastle Company for storage, which, in accordance with the existing statutory provisions, can only be obtained by the North Shields Company for a daily supply; and thus while the reservoirs of the Newcastle Company were being depleted, those of the Corporation would be filling. Your petitioners allege that this is an interference with the statutory rights of your petitioners under the said Act of 1894, which is unjustifiable, and may be productive of serious consequences in the summer months, not only to the city, but to the borough of Gateshead and the urban district of Walker, in which, as before mentioned, your petitioners are large owners of property, and to the other places within the limits of the Acts of the Newcastle Company; and they submit such a power ought not to be sanctioned. Should, however, your Right Honourable House, notwithstanding the objections of your petitioners, consider that some concession with regard to the storage of water might be made to the Corporation without danger to your petitioners, they humbly submit that it should only be to the extent of the following proviso to be added to clause 25 of the Bill." And then followed a statement as to restrictions to be put upon the storage of water. The learned Counsel submitted that the storage of water had nothing to do with the petitioners. The water acquired from the Newcastle Company could be run to waste by Tynemouth if the owners of the Tynemouth Water-Works so desired; and the Bill would not touch any agreement existing between the Newcastle Company and the Tynemouth Company. There was nothing to prevent the water being stored now; but, at any rate, storage could not hurt the Newcastle Corporation. The remaining allegations of the petition were more or less of a general character.

Mr. FREEMAN, in defending the *locus standi* of his clients, said that the promoters were for the first time seeking to obtain power to store water which they got from the Newcastle and Gateshead district. While they might be pinching Newcastle for water, they might be taking more themselves than they had any need for. Clause 25 was the one to which he objected; and if it were struck out, he should have no more to say against the Bill. The clause was as follows: "The Corporation may use the existing reservoirs of the Company, transferred to them under the powers of this Act, and any reservoirs which may be constructed by them under the unrepealed powers of the Act of 1786, for the storage of water obtained by them from the Newcastle and Gateshead Water-Works Company, or from any other Company, authority, body, or persons for providing a supply of water for the purposes of this Act." The promoters here sought storage powers which they did not possess at the present moment. If the clause was meaningless, then it should be struck out; but if it was meant to be effective, the greatest damage would be done to the Newcastle Corporation. He pointed out that the Corporation had been heard in former years on Bills promoted before Parliament to effect the very thing which was now proposed.

Mr. PEMBER, in reply, said that it was unreasonable to object to the power of the promoters to store water, seeing that they already had power to take the water and do what they liked with it.

The room was cleared; and on the re-admission of the public,

The CHAIRMAN stated that the Committee were unanimously of opinion

that the Corporation of Newcastle had no *locus standi* to be heard against the Bill.

Mr. PEMBER then addressed himself to criticizing the petition of Earl Percy and the remaining opponents of the Bill; pointing out that the objections raised would in every case come before their Lordships in evidence as witnesses were called before them.

Mr. *Simley*, Borough Surveyor of Tynemouth, was the first witness called for the promoters. Examined by Mr. PEMBER, he said the Water Company had been in existence for over a century. The district of Tynemouth comprised 4317 acres; of Whitley and Monkseaton, 1650 acres; and of Merton, 684 acres. The respective populations were 51,075, 4733, and 650. The rateable value of Tynemouth was £185,000; but he was unable to give the value of the portion which was supplied with water. The present water supply was inadequate and unsatisfactory in quality. The Company were not under the Water-Works Clauses Act; and they did not supply water as if they were. The consequence was that a feeling of dissatisfaction was general among the population of Tynemouth; and this discontent had existed ever since he had been acquainted with the place. So long ago as 1869, the matter had been reported on by the late Mr. Hawksley, who was of opinion that the then existing supply should not be allowed to continue another season.

The CHAIRMAN inquired whether it was the intention of the Corporation, if they obtained their Bill, to remove the objections to the supply and put it on a thoroughly satisfactory footing?

Mr. PEMBROKE STEPHENS replied that it was.

Mr. BALFOUR BROWNE called attention to the fact that the supply could at once be taken over by the Corporation, if the Water Company failed to afford an efficient and pure supply of water.

Witness (continuing) said the Company had been compelled by injunction to abandon certain sources of supply. From their present works, they had only a reliable supply of 210,000 gallons of water per day; and according to the report of an analyst, some of the water which was taken at Billy Mill contained solid matter in suspension.

The CHAIRMAN: Would you use this water if you obtained your Bill?

Mr. PEMBROKE STEPHENS: For flushing purposes only.

Mr. BALFOUR BROWNE: You would get what we have at present.

Mr. PEMBROKE STEPHENS: But we should hope to secure a new supply.

Mr. BALFOUR BROWNE: As we do.

Mr. PEMBROKE STEPHENS: But you have no means—you have reached the limit of your powers.

Witness, further examined, said that the Company got some of their water from Whitley Quarry; and this largely consisted of surface drainage water. The reservoir at the quarry was below the level of the quarry itself; and he had on several occasions noticed town refuse and stable manure on the adjacent land. More than one attempt had been made to bring about the transfer now asked for. Water was taken from the Newcastle Company and mixed with that of the Tynemouth Company. But this was not to be relied upon as an auxiliary supply; for in the case of the Newcastle Company requiring all their water, the Tynemouth Company would get none, and would have to fall back on their own resources—the supplies from Billy Mill and Whitley Quarry. Sea water had been resorted to by the Tynemouth Corporation for street-watering and market washing; and this necessitated two sets of mains in the streets. Sea water had not been found suitable for flushing, as it corroded the pipes; and water for this purpose had to be carried to certain points by carts. In case of a fire occurring, the turncock had to be awakened and sent a considerable distance to turn on the high-pressure supply. After an outbreak of fire which occurred in August last, the Company were called upon by the Corporation to keep their mains charged at high pressure. The Company, however, declined to do this. As a matter of fact, the interests of the inhabitants demanded that the works should be handed over to the Corporation. The Company had a capital of £60,000, with borrowing powers of £37,000. They had, by using their reserve, paid a dividend of 2½ per cent.; and witness would be unwilling to invest in the undertaking. The reserve of the Company amounted to £450; and no higher rates could be charged, as they already received the maximum—1s. 6d. in the pound.

Cross-examined by Mr. BALFOUR BROWNE: Beyond the 900,000 gallons of water per day now supplied by the Company, 500,000 gallons extra were necessary for the proper supply of the district.

Mr. BALFOUR BROWNE: And you have come forward to ask for powers merely to take over the 900,000 gallons a day?

Witness: Yes—at the moment. He was aware that the Newcastle and Gateshead Company had a storage capacity of 3000 million gallons; and that they contemplated increasing this to 5000 million gallons. In his opinion even the last-mentioned storage might be exhausted by Newcastle to the deprivation of Tynemouth. If the Bill became law, it was possible the charges for water to Whitley and Monkseaton would be increased.

You have speculated on markets, have you not, and made a dead failure of it?—I have heard it defended, even as it is.

Cross-examined by Mr. FITZGERALD: Whitley and Monkseaton was a growing district; and the charges there would be increased.

Mr. FITZGERALD: What justification have you for thus increasing the rate?

Witness: We desire to be equitable, that is all.

It is a queer way of being equitable, to increase the rates without improving the supply?—We propose to increase the supply.

But not by this Bill?—No; but we propose to do so by another Bill.

By Mr. RAM: The North Shields Water Company were not the distributing authority for Murton; but they supplied the town with water in bulk. Possibly, if the rural sanitary authorities were left alone, they would obtain a further supply. However, he did not think it to be of much importance whether Murton was included in the Bill or not.

Mr. RAM: Are they prepared to take it out?

Witness: I do not know that there would be much objection to doing that.

Mr. PAGE: Do you wish it taken out?

Mr. RAM: I do.

Mr. PAGE: Then it shall be taken out.

Mr. RAM: In that case, I have not another word to say.

Witness (continuing) said he did not think it unreasonable to look to Newcastle for a water supply; Tynemouth being on the Tyne and in its watershed. If Newcastle did not give an adequate supply to the place, it would be necessary for Tynemouth to come forward with legislative proposals, either to develop a supply of their own, or to compe Newcastle to give them the supply they required.

Mr. *G. Armstrong*, Deputy-Mayor of Tynemouth and a member of the Tyne Commissioners, said he had taken an active part in local affairs. In 1891, there was a proposal for the Tynemouth Water Company to take over the North Shields Water Company; but he had opposed, and induced the ratepayers to reject it. He was not satisfied with the Company's supply at that time. An injunction was subsequently sought and obtained to put a stop to the Shire Moor supply. The Water Company came to Parliament for further powers, including power to sell; but the Bill was thrown out by the House of Lords. The Company had done nothing since then but obtain 300,000 gallons of water a day from the Newcastle Company, to make up for the loss of the Shire Moor supply. The Company at present gave an inefficient supply for the extinction of fires, and had refused to give high pressure in the mains. Ratepayers' meetings had been held in Tynemouth which were practically unanimous in favour of the transfer of the water undertaking to the Corporation. He declared that, even if the Company desired to give a better water supply, they had not the financial ability to do so. The feeling of the population was that, unless this Bill were passed, the town could not be considered safe. The bursting of a pipe connecting them with the Newcastle Water Company might deprive them of their supply.

In cross-examination, witness said that the Chairman of the Water Company was frequently in the Tynemouth district; and the Vice-Chairman was a resident, though it had been pointed out that the management was not local. There could be no doubt that the Tynemouth Corporation, if they obtained their Bill, would in the future come forward for powers to get an improved water supply. If necessary, they would be prepared to ask for compulsory powers as against the Newcastle Company. The Tynemouth Corporation were prepared to pay a fair price.

Mr. *R. Simpson*, the Secretary and Manager of the North Shields and Tynemouth District Tramways Company, gave evidence as to the defective character of the water supply in the borough.

Mr. *John Pattinson*, Public Analyst for the County of Northumberland, said that the samples of water which had been supplied to him by Dr. Gofton were, both as regarded hardness and the presence of organic impurities, of a quality very undesirable in a town supply.

Mr. *J. Huish*, Chief Constable of the borough of Tynemouth, gave evidence to show that the present water arrangements were insufficient to enable the authorities to cope with outbreaks of fire.

Wednesday, March 17.

On the re-assembling of the Committee to-day,

Mr. FITZGERALD said he represented the urban district of Whitley and Monkseaton; and, as he had indicated on the previous day, their opposition was practically confined to clause 52 of the Bill, which said: "The Corporation shall, at any time after the acquisition of the undertaking of the Company, when so required by any other local authority (as defined by the Public Health Act, 1875), sell to such authority such part of the water undertaking of the Corporation as shall at that time be situate in the district of such authority (except all pipes, mains, and other works required and used, or that may be required and used for supplying or conveying water to or into and for any other part of the area for the time being included within the limits of supply of the Corporation); and the compensation which such authority shall pay for the same shall be such price as may be determined by agreement between the Corporation and such authority, or such as failing agreement shall be settled by arbitration under the Lands Clauses Acts. And after any such sale, the powers and obligations of the Corporation to supply water within the district of such authority shall cease." The promoters of the Bill had now agreed to a modification which would protect the district of Whitley and Monkseaton; and, under these circumstances, the Urban District Council did not desire to continue their opposition to the Bill. They had always been in favour of the principle of the Bill, though desiring a modification of the clause to which he referred. This modification having been agreed to, they must be taken as supporting the Bill.

Mr. *J. Mansergh*, M.Inst.C.E., examined by Mr. PEMBROKE STEPHENS, said he was familiar with the conditions of the undertaking which formed the subject of the present inquiry. He had visited the Tynemouth Water-Works with Mr. Smiley; and under the Public Health Act of 1875, he had acted as Arbitrator in regard to the Company. Therefore, more or less, the circumstances of the undertaking were familiar to him through previous knowledge. In 1894, he was engaged in connection with the Newcastle and Gateshead water supply—the source from which the Tynemouth Company derived their supplementary service. He thought that the present state of things was not desirable in the interests of the district. The case against the Company, who seemed to have no due sense of their obligations, was a strong one. He considered that the Corporation were but discharging their duty in asking for powers to acquire the undertaking, for they were the proper body to bring about the radical change that was necessary in the supply. The Company had gone about their work in a very slipshod fashion. In fact, he had never known a company who had managed their business so badly. The present petitioners had sought parliamentary powers in 1892, but had not been successful; and the powers they were now exercising, and the whole authority for the undertaking, were over a hundred years old. The supply of water for which the Company were directly responsible was not a proper one Both sources of supply—Billy Mill and Whitley Quarry—were unfit human consumption, if only on account of the hardness of the water.

Mr. PEMBROKE STEPHENS: If the Company came to Parliament for first time, and asked to be allowed to use the water from these two sources of supply, you would not approve of it?

Witness: Certainly not.

So far as the supplementary supply is concerned, though it may be very good in quality, is it of such a character that it can be permanently relied upon?—No; the agreement with the Newcastle and Gateshead Company is a precarious one. In my opinion, it is not wise or proper that a town should be dependent, in the first place, on these wholly unsatisfactory sources of supply, and, in the second place, on a precarious agreement with the Water Company of another place. The town of Tynemouth ought not to be dependent upon the present sources for its water supply. I have no objection whatever to make to the Newcastle and Gateshead supply; but, as I say, it cannot be depended upon in

perpetuity. The pressure of the water supply to Tynemouth is also very inadequate. If the undertaking were in the hands of the Corporation under the powers of this Bill, I am clearly of opinion that a great deal could be done in the way of improving the supply. Further storage capacity is required; and the reservoirs should be at a higher elevation.

Witness, in further examination, said that if fair and adequate compensation were paid to the Company, he did not think that the transfer would entail the least hardship, even supposing they had been doing their duty during the past fifty years, which certainly was not the case. It seemed to his mind that many advantages accrued, under ordinary circumstances, from the transference of water undertakings to municipal authorities; but in this instance, there were very special reasons which rendered the transfer desirable.

Cross-examined by Mr. BALFOUR BROWNE: In principle, he favoured the control of the water supply being in the hands of the public authority. The Public Health Act, section 52, gave a corporation power to set up a water supply if the company failed to afford an adequate and proper supply; but before doing so, the matter must be submitted to arbitration, to decide whether or not the company's supply was an efficient one. The future of Tynemouth, with respect to its water supply, rested with the fate of the present Bill, and on the advice which might be given to the Local Authority. The cost of the water would depend on the nature of the works undertaken. If the Corporation had control of the water supply, they would probably be able to dispense with the Billy Mill and Whitley Quarry sources of supply—so the Company might be able to do so.

Cross-examined by Mr. BAGGALLAY, on behalf of Earl Percy, witness said he considered that the best thing, in the circumstances, would be to allow the transfer of the works to the Corporation; leaving them free to do whatever might appear necessary in the future.

Mr. PEMBER (interposing) said he thought that the clause objected to might be so modified that the promoters would buy from Earl Percy by agreement the land required for fresh reservoirs. He felt sure that, as the land would be required for public purposes, Earl Percy would not refuse to sell—especially as the petition of his Lordship bore testimony to the necessity of a good water supply for the neighbourhood.

Mr. BAGGALLAY said that the object of his cross-examination was to show that, not only was an improved supply requisite, but that it was immediately necessary.

Re-examined by Mr. PEMBER, witness said that the Corporation took ordinary powers to supply Tynemouth and district with water under pressure. At present, a constant supply could not be given; but no doubt provision would be made for it in the future.

This concluded the case for the Bill.

Mr. *Armstrong*, recalled and cross-examined by Mr. BAGGALLAY, stated that in 1889 a Bill was introduced into Parliament to take water from the River Rede; and it was then provided that, in consideration of the watershed being handed over to the promoters of that Bill, a supply of water should be given to North Shields. The Tynemouth Corporation, in 1891, desired to promote a Bill to obtain possession of the water undertaking; but they could not obtain the consent of the ratepayers.

Cross-examined by Mr. PAGE, witness declared that the Company, by basing their charges on rental instead of rateable value, had illegally taken out of the pockets of consumers in Tynemouth some £50,000.

Mr. WORSLEY TAYLOR, addressing the Committee on behalf of Earl Percy, said the view Mr. Balfour Browne might take for the Water Company did not affect him. He, on his part, was prepared to accept as proved the statements made in the preamble of the Bill; and he did not intend to call witnesses. What he desired to insist upon, was that Lord Percy was entitled to ask that reasonable security should be given that existing nuisances would be removed by the Bill; and he thought that, in the absence of such security, the Bill was not entitled to succeed. He then entered at length upon the history of the efforts made by the Corporation to get rid of the Water Company; and he pointed out that the Bill, as it stood, offered no guarantee that the interests concerned would be better off as should be the case.

Mr. BALFOUR BROWNE, for the Company, declared himself doubtful as to this being a genuine Bill. He denied that any useful purpose could be served by the proposed transfer; and he pointed out that the proposal was really to transfer the Tynemouth Company's business to the Newcastle and Gateshead Water Company. This was why the Corporation had not come forward with a scheme of their own. If the promoters could get water from the Newcastle and Gateshead Company, so could the Tynemouth Water Company; and he would tell the Committee what the latter were prepared to do. If the Committee thought that the Billy Mill and Whitley Quarry supplies were bad, and the Tynemouth Corporation would give notice that the waters were unfit for human consumption, the question would be carried to arbitration; and if the Arbitrator found that the contention of the Corporation was correct, the Company would cease to take a drop of water from the sources complained of, and would derive the whole of their supply from the Newcastle and Gateshead Company. But it must not be forgotten that these two sources of supply at Billy Mill and Whitley Quarry had been paid for to the Duke of Northumberland; though, if they were forced to go elsewhere, the Company would be quite willing to stop these sources of supply. Under these circumstances, no harm would be done to the Corporation; they would get the very water they said they wanted. If it was the firm intention of the Corporation to be made part of the Newcastle and Gateshead district, why could they not become such, and still get their water through the pipes of the Tynemouth Company? This was a very unfair Bill. The Company were not prosperous; they had not reached their maximum dividends. The shares were at an extremely low value; and this probably was why the Corporation wished to buy the undertaking. They thought they could get it cheap at this moment—at a period just before the time when the proprietors might reap a little reward. The population of Tynemouth and neighbourhood was increasing; the supply of water was increasing; and the time when the Company might expect some little remuneration was coming. The Corporation wished to prevent the Company from obtaining this reward, for no other purpose than that of passing the undertaking over into the hands of another Company. He submitted that this was not a *bonâ fide* Bill. It was not a fair purchase by the Corporation; and he therefore asked their Lordships to say that the measure should not proceed.

The CHAIRMAN: What is the actual difference between purchase under the Lands Clauses Act and under the Public Health Act.

Mr. BALFOUR BROWNE: I think the difference is this: That first of all, under the Lands Clauses Act—say, in connection with a piece of land—the promoters offer £100; and they then go to arbitration. Supposing that the Arbitrator found the value of the land was £110, the promoters would have to pay the whole of the cost of the arbitration. If, on the other hand, the Arbitrator should find that the value of the land was £90, the promoters would still have to pay their own costs; but the landowner would have to pay his. That is one difference. Then there is another. Under the Lands Clauses Act, it has become customary in all cases, beyond the value of the property, to make an allowance of 10 per cent. for what is called "compulsory purchase." That covers a large number of things—such as the cost of re-investment, and damages which cannot be foreseen, and other things. But the land owner under the Lands Clauses Act invariably gets 10 per cent. for compulsory purchase. It is doubtful whether, under the Act the promoters are proceeding upon, we shall get anything for compulsory purchase. Under the Public Health Act, the Arbitrator has a discretion as to costs. He can award them when he likes; and it is doubtful—I think more than doubtful—whether he would have a right to give anything for compulsory sale in this case.

Mr. PAGE: This purchase is not under the Public Health Act, but under the Arbitration Act; and the Arbitrator may assess the purchase-money in any way he may think fit.

Mr. BALFOUR BROWNE said that when the promoters came to sell any portion of the undertaking, they would proceed under the Lands Clauses Act; but when they came to buy, they adopted the more advantageous process.

The CHAIRMAN: What would be the effect of cutting out clause 25?

Mr. PAGE: We should be left in the same position as the Company occupy at present. If they have power to use Lord Percy's reservoirs for the purpose of storing Newcastle water, we should continue to have that power. It is suggested that Lord Percy should have compensation if we are given the power by Act of Parliament, which we claim now to possess. It is only to make it clear that we have the power, that we put in this clause. We say that, as a matter of fact, the reservoirs are used, and have been for years, for the purpose of storing Newcastle water.

The room was then cleared; and on the re-admission of the public,

The CHAIRMAN said: The Committee are unanimously of opinion that the Bill should be allowed to proceed, provided a clause is inserted protecting Lord Percy from a roving commission over his land, and also provided that the Corporation come to Parliament next year for a Bill to furnish a better water supply.

It was then arranged that the promoters should have time to consider this decision.

Friday, March 19.

Before the Committee rose this afternoon,

Mr. PAGE announced that the promoters' and petitioners' Agents had agreed on the following points: A single Arbitrator to be appointed by the Institution of Civil Engineers; to keep alive clause 7 of the Act of 1786, with like limiting words to rights and easements acquired under the Act of 1786; to keep alive clause 11 of the Act of 1786, with like limiting words; a certain rider and provisions to be accepted, subject to settling the question between proceeding under the Arbitration Act and the Lands Clauses Act, which is to be left to the Committee, and subject also to the alteration providing for a single Arbitrator. Counsel then applied for an extension of time, from one to two years, in which the Corporation should be compelled to bring in a Bill for an improvement scheme.

The CHAIRMAN said he had never before heard of a Committee being asked to re-consider its decision. There was plenty of time between now and next November to mature the plans which, he was sure, some of the learned Counsel's clients had already wisely arranged in their own minds. It would be difficult to alter the decision of the Committee; and it was not a thing usually done in those rooms. He confessed that he, for one, should advise the Committee not to assent to the suggestion.

Mr. PAGE urged that a Bill promoted next November would not be so satisfactory to inhabitants of the district as a Bill of 1899 would be.

The CHAIRMAN: I think you must accept the Bill on the terms we have imposed.

Clauses were then dealt with by the Parliamentary Agents and the Committee; and the Bill was ordered to be reported to the House, with amendments.

HOUSE OF LORDS COMMITTEE.

Tuesday, March 16.

(*Before Lord* KNUTSFORD, *Chairman, the Marquis of* GRANBY, *the Earl of* STAMFORD, *Lord* WENLOCK, *and Lord* CLIFDEN.)

MALVERN LINK GAS BILL.

This Bill, which is to authorize the Malvern Link Urban District Council to acquire the undertaking of the Malvern Link Gas Company, Limited, and to supply gas within the district and adjacent places, came before the above-named Committee to-day.

Mr. LITTLER, Q.C., Mr. WORSLEY TAYLOR, Q.C., and MR. RAM appeared for the promoters; while the Great Malvern Urban District Council, who had a competing scheme for the purpose of enabling them to supply Malvern Link with gas, and to purchase the gas-works, had for their Counsel Mr. BALFOUR BROWNE, Q.C., and Mr. FORBES LANKESTER. Watching briefs were held by Mr. J. D. FITZGERALD, Q.C., and Mr. H. G. FARRANT for the Malvern Link Gas Company; and by Mr. FREEMAN, Q.C., and Mr. CLAUDE BAGGALLAY for the Great Western Railway Company.

Mr. LITTLER, in opening the case on behalf of the promoters, said Great Malvern was a district created by the Malvern Improvement Act of 1851, under which power was given to the Malvern Commissioners to construct gas-works for the supply of Great Malvern; and by an amending Act passed in 1858, the limits of supply were extended so as to include Malvern Link and certain other places outside. In consequence of the failure of the Great Malvern Local Board (as they were then called) to supply Malvern Link with gas, though they were pressed to do so, a limited liability Company was formed in 1861 for the purpose of supplying the district with gas. Not only did the Great Malvern Local Board not attempt to interfere and stop the Link Company, but in 1873, when it

became necessary to light a certain portion of Great Malvern, known as Worcester Road, through which the Great Malvern people had not laid a main, inasmuch as it was an important thoroughfare for the Link people, the Link Local Board, which was established in 1871, applied to Great Malvern to light a certain portion of the road. The Great Malvern people offered to contribute 30s. per annum each towards the lighting of ten public lamps by the Link Company. This offer was accepted by the Link Local Board, and with the exception of one year, in which, owing to a dispute with the Link Gas Company, the Link Local Board—or District Council, as it is now—had lighted the lamps in Worcester Road with oil, this arrangement had continued in force. In addition, though the Great Malvern Urban District Council had their own gas-works, from which they supplied Great Malvern and a part of the surrounding district, the Link Company supplied the Great Western Railway Station, the Imperial Hotel, and some private houses in Great Malvern without the slightest objection on the part of the Great Malvern people. Having already established water-works of their own, the Link District Council resolved to purchase the gas-works, and to become entirely independent of Great Malvern both as regards gas and water. The Link Gas Company expressed their willingness to sell on arbitration terms; and a binding contract had been entered into for the purchase of the gas-works, subject to the sanction of Parliament. The moment the Great Malvern District Council learnt of this, they sent a notice to the Link District Council to discontinue supplying gas through the Link Company, and deposited a Bill for the compulsory purchase by themselves of the Malvern Link Company—relying, in fact, upon obsolete legislation to do that which they would otherwise have no right to do, because, under modern legislation, they would either have been obliged to supply the Link district with gas within a limited time, or have transferred the obligation to the authority of the Link district. Carrying into effect the agreement with the Link Gas Company, the Link District Council proposed to light, not only the Link district proper, but also, at the request of the population themselves, the parishes of Leigh, Mathon, Newland Madresfield, and Bransford and Cradley. Referring to the proposal of the Great Malvern District Council, Counsel remarked that there was no precedent for allowing one local authority to usurp powers of the kind sought over a neighbouring district which was ready and willing to carry on its own work in its own way. He confidently submitted that such a proposition would not be sanctioned by a Committee of the House of Lords.

The CHAIRMAN: As I understand, the only opposition comes from the Great Malvern Urban District Council.

Mr. CLAUDE BAGGALLAY: The Great Western Railway Company also appear, for the purpose of securing protection as to the price of gas.

Mr. FITZGERALD: I appear for the Link Gas Company; but we have agreed with the Malvern Link District Council, and support their Bill. We oppose the Great Malvern Bill.

Mr. *Edmund H. Stevenson*, M.Inst.C.E., examined by Mr. RAM, explained that, having seen the Link Gas-Works and had an account of the apparatus given to him, he had come to the conclusion that they were perfectly sufficient for the supply of the district at present. As the district grew, the works would have to be enlarged. Within a short time, no doubt, the works, and especially the mains, would have to be extended. There was a large working-class population in the district, which did not at present take gas; and if they were to be induced to do so, they must be offered the usual facilities in the way of meters and fittings.

Mr. RAM: Do you know the total number of consumers supplied by the Great Malvern District Council outside their own district?

Witness: I believe the actual number of houses is sixteen; and one of these is situated partly in their district and partly in Malvern Link.

Do the promoters now supply gas within the Great Malvern district?—The Link Gas Company supply gas within the district.

Is that actually done at the request of Great Malvern?—The portion of the Worcester Road facing the common, and close to the Link railway station has been lit by request of the Great Malvern District Council.

Cross-examined by Mr. LANKESTER: It was proposed in terms to repeal the Act of 1858, which gave the Great Malvern District Council power to supply within the area covered by the Bill; but this was because that body had neglected their duties during the past 40 years.

Mr. LANKESTER: As soon as they obtained their Act, they proceeded to construct the Great Malvern Gas-Works, from which they supply a very large quantity of gas yearly?

Witness: They supply in their own district as much as it will take.

I believe it is between 50 and 60 million cubic feet?—Yes.

As the Link Gas Company had no statutory powers to begin with, everything that they have done must have been with the permission of the Malvern Commissioners and the Malvern District Council?—Not at all. It has nothing to do with the Malvern District Council.

Do you suggest that, within the limits of supply of the Malvern Commissioners, any company without statutory powers could enforce any right at all as to the supply of gas?—Certainly, as a general trader.

Do you really suggest that any general trader could compulsorily supply any portion of the district?—No, not compulsorily. It is only a permission to supply that is granted by Parliament.

But the Link Gas Company never had such power?—No; but they obtained power from the local authorities whose roads they opened.

I submit that everything that has been done by the Link Gas Company has been with the permission, and practically, it may almost be put, at the request of, the Commissioners?—I do not think so at all. In fact, the Council have no authority to pass on their powers. This has been decided in the Longton case. The Gas Company brought their main along the railway line, which is private property.

Do you say that this was done in spite of any opposition of the Commissioners?—It would have been done, no matter what the opposition. I do not know that there was any.

Do you suggest that the mains were laid along Worcester Road without the permission of the Great Malvern District Council?—I expect it was done with permission. I suppose your Council considered it would not pay them to lay the main.

So far as it was the duty of the Great Malvern Commissioners to see that the district was properly lighted, they have not neglected to do so?—As a matter of fact, it has been properly lighted by my clients paying the local Gas Company.

And if the Malvern Link District Council obtain the powers they seek, it will be lighted, will it not, at greater cost than would be the case by the Great Malvern District Council?—I am very much of opinion that it will not be.

What is the manufacture of gas at the Link Gas-Works?—About 14 million cubic feet, I believe.

Then if we add 50 million cubic feet, or whatever it is, for Great Malvern, that would be some 300 per cent. more?—Yes.

Do you not admit that this large quantity could be produced very much more cheaply per 1000 cubic feet than the amount which the Link Company make now?—Very possibly it could be produced more cheaply; but you would have to put up the works to do it first, and to abandon all your existing ones.

That is a question of adjustment entirely?—Indeed it is not. It is a matter of the interest on the sinking fund, which, of course, has to be added to the cost of the gas.

Is there any doubt that the manufacture of gas in large quantities is very much cheaper than if made in small quantities?—It is somewhat doubtful. It depends upon the management.

At the Link Gas-Works, does it not cost 3½d. more for the actual production?—It may do so; but that is not what it ought to cost.

So far as physical circumstances (the convenience of the railway, and so on) are concerned, the Link works have a superiority over those of Malvern?—Certainly.

They can get their coals cheaper than we can, inasmuch as they have to do no carting?—I presume that is so.

Then if it is a fact that the gas at the Link works costs 3½d. more to produce, that is due to bad management on the part of the Company?—No doubt. But if you removed all your manufacturing plant to the Link works, and threw out of use your present works, taking into account the interest on sinking fund, you would not save a penny.

Examined by Mr. BAGGALLAY: At the present moment the Great Western Railway Company were supplied in the Great Malvern district by the Link Company; and if the Bill passed, the Link District Council could supply gas to the Railway Company within their district, delivering it on the frontier; and the Railway Company could take it wherever they pleased.

The CHAIRMAN: You supply the Great Western Railway Company now within your district?

Witness: Both within our district and within the Great Malvern district. Pipes belonging to the Gas Company, for which the Great Western Company pay rent, run along the railway from one station to the other. If we treated these pipes as Great Western pipes, and supplied at one end of them just as we should to a house, I suggest that we should not be supplying outside our district.

The CHAIRMAN: That seems to me to be a very simple arrangement to make.

Mr. BAGGALLAY: We should have a great deal of responsibility in respect of these pipes. It would upset the whole of the agreement with the Link Gas Company, of which there are twenty years to run.

The CHAIRMAN: You would make a perfectly new agreement, of course.

Mr. BAGGALLAY (to witness): If the profits go in reduction of the price of gas as is proposed here, instead of going in relief of the rates, it does not matter, does it, so far as the consumers are concerned, whether they are supplied by one authority or by another?—Yes, it does, because another authority would have power to open the roads, which is very objectionable.

If the lighting of Great Malvern, Malvern Link, and Malvern Wells were in the hands of one authority, do you not think it could be done more cheaply than if Malvern Link was lighted by one authority and Great Malvern and the Wells by another?

Witness: It might be done a little more cheaply at present; but I do not think it would in the future.

Re-examined by Mr. RAM: So far from there being any hardship in taking away from Great Malvern the rights which they had allowed to lie dormant for 40 years, they ought not to be permitted to take under their wing again the area sought to be supplied by the Malvern Link District Council. In almost every case in which the supply of gas had been taken out of the hands of a private company and placed under a local authority, the price had been reduced; and he expected it would be so in Malvern Link.

Mr. *G. H. T. Forster*, Clerk to the Malvern Link Urban District Council, explained that Malvern Link was a health resort, which was increasing rapidly in popular favour. On one estate alone, fifty houses had been built within the last twelve months; new streets were being laid out; and the place was being developed very rapidly. As the district had extended, the Gas Company had laid mains and supplied gas in the added areas, without any objection being raised on the part of the Malvern Council, who, so far as he knew, had never put forward any claim to supply gas in preference to the Link Company. During the whole time he had been Clerk, the Great Malvern Council had paid to the Link Gas Company through the Link Council, 30s. per lamp in respect of the lighting of the ten lamps in Worcester Road, which was in the Great Malvern district. An application by Great Malvern for amalgamation with the Link district had been refused by the Worcestershire County Council; and after establishing their independence, Malvern Link obtained power to provide a water supply for themselves and the adjoining parishes within which they now asked for power to supply gas. So far as he could ascertain, all the communities affected were favourable to the Link scheme; and the whole of the district was more conveniently situated for being supplied from the Link Gas-Works than from those of Great Malvern. At a public meeting held last August, a resolution was unanimously passed in favour of opening up negotiations with the Link Gas Company, who, feeling that it was not an unreasonable idea that the gas supply should be in the hands of the Local Authority, agreed to sell the works as a going concern on arbitration terms. When his offer was made, the Company stated that unless it was accepted, they intended to come to Parliament for statutory powers. In these circumstances, it became important that the negotiations should be completed during the present session; and the offer of the Company having been considered by the Council, it was unanimously accepted, with the result that the Bill before the Committee was promoted with the approval of the ratepayers. In default of obtaining possession of the Link Gas-Works themselves, they would prefer that the Company should remain as now.

Cross-examined by Mr. LANKESTER: At the present time, Great Malvern supplied about a dozen of the houses in Malvern Link with gas. In order to furnish these houses with gas from the Link works, he admitted that it would be necessary to carry the pipes through private property.

Mr. WORSLEY TAYLOR intimated that the promoters were perfectly willing to make any reasonable arrangement that the Committee might see fit to suggest with regard to these few houses.

Cross-examination continued: It was many years ago that the Malvern Link people had requested Great Malvern to supply them with gas. He could not say whether the outside districts had applied to the Gas Company to be supplied. The indebtedness of the Malvern Link District Council was £3000; but he could not state what liabilities they were undertaking in respect of their water supply. Under the Bill of last year, they obtained power to borrow £60,000. The liability over the whole district, in respect of sewage, would be about £10,000; and there was a deposit of £3500 for the isolation hospital.

Examined by Mr. FREEMAN: The rateable value of the urban district of Malvern Link was £25,000; and the actual rating of the Great Western Railway Company was about £1000. Supposing the Bill passed, the District Council proposed to supply the Railway Company in the same way as the Gas Company did at present. He suggested that, by agreement with the Company, the District Council would not merely have the right to supply gas within the Link District, but would have power to carry it by means of a pipe along the Great Western railway into the Great Malvern district, and supply it there.

The CHAIRMAN: I should have thought this was a matter capable of settlement or agreement.

Mr. FREEMAN: We object to this gas undertaking being taken over by Malvern Link. We think the Great Malvern people would be far better able to supply gas satisfactorily; and we also appear in the position of ratepayers objecting to have our rates put up, as we are afraid will be the case under the Bill.

The CHAIRMAN (to witness): The Great Malvern District Council could supply the station in their district; and you could supply the station in the Link district?

Witness: Yes; it could be done in that way.

Leaving the question of carrying the pipes along the railway, Great Malvern would be ready enough to supply the station in their district?—Yes; I suppose they would be obliged to do so. But there is a rising gradient from Malvern Link to Malvern; and it would be very convenient to supply Malvern station from the Link.

Mr. LANKESTER: Your standard price is 5s. per 1000 cubic feet in the Bill?

Witness: 5s. per 1000 feet gross; 4s. net.

And in our Bill it is 4s.?—Yes.

Your standard illuminating power is 15 candles; and ours, 17 candles?—Yes.

Mr. RAM: The price mentioned in the Bill is merely the maximum up to which we ask to be allowed to go. (To Witness:) With regard to the gas, instead of that being a matter of indebtedness, will it in your opinion be a valuable asset?

Witness: Yes.

Wednesday, March 17.

On the re-assembling of the Committee to-day,

Mr. *W. W. Arrowsmith Tree*, formerly Chairman of the Malvern Link Local Board, gave corroborative evidence, with reference to the supply by the Link Gas Company of certain parts of Great Malvern; and stated that during the ten years that he occupied the position of Chairman of the Local Board, there was no notification by Great Malvern that the Link Company were infringing any rights of supply.

Cross-examined by Mr. LANKESTER: He could not say that the Company were working in unity with Great Malvern. They simply lighted the district because the Great Malvern people would not do so.

Mr. *W. Stallard*, Agent for Lord Beauchamp, said it was the desire of his Lordship that the parishes of Madresfield Newland, Leigh, Mathon, Bransford, and Cradley, in all of which he had property, should be supplied with gas by Malvern Link, rather than by Great Malvern.

Colonel *W. Ottley*, Chairman of the Malvern Link District Council, having confirmed the evidence given by Mr. Tree and Mr. Forster,

Mr. *G. Warner*, an old inhabitant of the Link district, testified to the fact that the Great Malvern Commissioners were asked in 1861 to light the Link District; but they refused. The Gas Company was formed, and had lighted the Link District ever since.

Dr. *Dixey*, Mr. *Maybury*, Mr. *Thomas Newbigging*, Mr. *Nevile*, and Mr. *Holland* having been examined in support of the contentions of the Great Malvern Urban District Council,

Mr. BALFOUR BROWNE addressed the Committee on behalf of that authority.

Mr. FITZGERALD and Mr. FREEMAN then spoke on behalf of the Link Gas Company and the Great Western Railway Company respectively.

The Committee deliberated in private for a short time. On the re-admission of the Counsel and parties,

The CHAIRMAN said: The Committee have carefully considered this case; and they do not think it necessary to call upon you, Mr. Littler, to reply on behalf of the Malvern Link Urban District Council. We find that the preamble of their Bill is proved.

Mr. LITTLER: Of course you decide at the same time that the Great Malvern Bill does not proceed.

Thursday, March 18.

On the sitting of the Committee this morning,

Mr. LANKESTER said he understood the decision of the Committee to be, on the one hand, that the Link District Council should be entitled to supply within their own area, and that the Great Malvern District Council should not encroach upon it; while, on the other hand, it was not desirable that the Link District Council should have any power of encroaching upon the Great Malvern area.

The CHAIRMAN: That is our feeling—that each district should supply itself.

Mr. LANKESTER then brought up a clause carrying out the intention of the Committee, that the two districts should be absolutely separate, and not encroach upon each other in the matter of gas supply.

Mr. BAGGALLAY intimated that the Great Western Railway Company strongly objected to this clause.

The CHAIRMAN: We thought that, after the lapse of a certain time which we must give for the Great Malvern District Council to lay down pipes, the Great Western Railway Company would be supplied the same as the rest of Malvern. We do not see how the Railway Company can be damaged.

Mr. LANKESTER: We have the pipes on the railway.

Mr. BAGGALLAY: There is a great deal more in it than that. It would not do for us to allow the existing agreement to be torn up, as it would be under Mr. Lankester's proposal, and to be left to the chance of what agreement we might be able to make hereafter with the Great Malvern Local Authority. A way out of the difficulty might be found if we could enter into an agreement exactly upon the same lines in the Great Malvern District Council.

The CHAIRMAN: Or a provision might be put in the Bill that the supply of gas to the Railway Company by the Link Company should cease on the making of an agreement with the Great Malvern District Council.

Mr. LANKESTER: The only thing is that the agreement deals with other matters besides the supply of gas. We are willing to enter into an arrangement with the Great Western Railway Company to supply them with gas upon terms similar to those upon which they obtain it at present. Under our Gas Act, we are bound to supply every one at a uniform rate; and we cannot make preferential charges.

Mr. BAGGALLAY: It is not a question of price alone. There are many other matters, such as the maintenance and repair of the pipes along the line of railway from one station to the other, and so forth.

After some conversation on this matter,

Mr. FITZGERALD said he was not sure that, if the clause suggested were inserted, it would not affect the Gas Company very seriously. They had to sell the whole of their undertaking; and if part of it were cut off, it might injure them.

The CHAIRMAN: The Company have sold themselves and their rights to the Link District Council. I do not see how you are damaged.

Mr. FITZGERALD: But the price is not yet fixed. It is to be settled by arbitration; and if we go before an Arbitrator and the Act provides that part of the undertaking we have to sell is no longer in existence, it will be urged that the Arbitrator must cut down the compensation. If your Lordship admits the clause, I must ask you to insert a proviso that it shall not affect the price payable to the Company; and I am bound to point out that this would be very unfair to the Link District Council. The supply of gas by the Company to the Great Western station is a perfectly legal one at present; and as the contract would continue to be binding under this Act, not upon the Link Council, but upon the Company, who would be unable to perform it, I am by no means sure that the Great Western Company would not be entitled to damages from the Gas Company for breach of contract. I think they would.

The CHAIRMAN: Not if the agreement is put an end to by statute.

Mr. FITZGERALD: If you word it so that the contract is put an end to, and an agreement is come to between the Great Malvern District Council and the Great Western Company, then the Gas Company will get their full compensation.

The CHAIRMAN: The first part of your argument is a serious one—that in making your terms with the Link District Council before an Arbitrator, you would be in a different position if this agreement is only to run a year from what you would if it had to run twenty years.

Mr. FITZGERALD: I must ask to have a proviso added that it shall not affect the amount of the Gas Company's compensation.

Mr. RAM: The Gas Company entered into an agreement with the Great Western Company which is worth £400 a year to the Gas Company; and if we, as their successors, come under their liabilities, and that amount is suddenly taken away by the parties going behind our backs, we lose £400 a year.

The CHAIRMAN: You gain your preamble.

Mr. BAGGALLAY: If the Great Malvern District Council had obtained their Bill, they proposed to take over the agreement as it stands, just in the same way as the Link Council propose to take it over. If the Great Malvern Council want me to come as their customer, I ask that they should undertake, or that the Bill should be so framed that they should be obliged to undertake, the same obligation as the Gas Company are under now.

Mr. BALFOUR BROWNE: There is no question of the Link Council losing £400 a year. A million cubic feet of gas, at 3s. 4d. per 1000 feet, comes to £170. The Gas Company supply half a million cubic feet to the Great Western Company, worth £85; and Great Malvern is supplying about £80 worth of gas in the Link district, so that we should each lose about the same amount.

After conferring with the other members of the Committee,

The CHAIRMAN said: The Committee are in a special difficulty—that is the difficulty raised by the Link Gas Company—that if they go to an Arbitrator, being bound to sell their undertaking to the Link District Council, they would say: "We must receive the value of the agreement which is to last for 21 years." If we put an end to the agreement, the Company would be in a very different position before the Arbitrator, because the compensation would be for only one year. Our object was that each district should supply itself, and not any part of the other; but with these difficulties raised by the Counsel representing different interests, we can only pass the Bill without making any alterations. Therefore Great Malvern must go on serving these houses, and Malvern Link must continue supplying the Great Western Railway Company. It is against our wishes. We did hope that some arrangement would have been come to.

Mr. BALFOUR BROWNE: If you pass the Bill as it stands, we should be debarred from supplying the houses in the Link district, because clause 51 says: "From and after the passing of this Act, the Malvern Urban District Council shall not supply gas within the limits prescribed by the Act; and all powers and obligations on the part of Council to supply gas within such limits, shall cease and determine."

The CHAIRMAN: We will shape the Bill in such a way that your Council shall go on serving the houses in the Link district, unless an arrangement can be come to; and, in like manner, the Link Company will continue supplying the Great Western Company.

The clauses having been adjusted, the Bill, as amended, was reported for third reading.

HOUSE OF LORDS COMMITTEE.

(*Before the Earl of* CAMPERDOWN, *Chairman, the Earl of* ROMNEY, *the Earl of* ORFORD, *Lord* ZOUCHE OF HARYNGWORTH, *and Lord* ABINGER.)

NEWPORT CORPORATION WATER BILL.

This Bill, which is to empower the Newport Corporation to construct certain works in substitution of those previously authorized, and to revive powers for carrying out other works, came before the above-named Committee on the 16th inst. Mr. Freeman, Q.C., and Mr. Claude Baggallay appeared for the promoters; Mr. Castle, Q.C., Mr. Littler, Q.C., Mr. Moon, Mr. Lewis Coward, and Mr. Lloyd represented the petitioners against the Bill—the Chepstow Rural District Council, the Great Western Railway Company, and Mr. W. S. Lang. Mr. Freeman, in opening the case, referred to the growing importance of Newport, in which the population had increased from 54,000 in 1891 to 65,000 at the present time. The rateable value also had risen greatly; it having been £249,000 in 1891, while it was now £290,000. The Corporation had fulfilled their duties with respect to ensuring the well-being of the town; and they were promoting the Bill for various purposes—the chief portion to which there was any opposition being that relating to the water-works. Counsel then proceeded to give details of the action of the Corporation in acquiring the undertaking of the Water Company, and said they now applied for a renewal of their original powers. No new streams were to be tapped. They sought power to borrow £150,000 on the security of the water undertaking; £35,000 being for new works. Practically, what they were doing was to carry out the powers conferred by their Act of 1888. The Chepstow Rural District Council alleged that the Bill would injuriously affect their interests; but the principle upon which their petition was framed was misconceived. Mr. Lang, in his petition, said that the quantity of compensation water granted under the Act of 1887 was not sufficient, and he wished to reopen the case; but this was not within his rights. He was the owner of certain mills it had been proposed to take, but he (Mr. Freeman) was prepared to leave them out of the scheme. The Chairman inquired if this concession would meet the views of Mr. Lang. Mr. Lewis Coward said Mr. Lang did not wish his mills to be taken; and to this extent, if the promoters dropped this portion of the scheme, his views would be met. After the promoters' case was closed, the Chairman intimated that, so far as the opposition of the Chepstow District Council and the Great Western Railway Company was concerned, Counsel need not argue the matter. Mr. Freeman thereupon submitted that there was then no opposition to the preamble of the Bill except on behalf of the millowners. After deliberating in private, the Chairman announced that the points the Committee had to deal with were, so far, only with regard to the supply of water; and they were of opinion that the Bill should proceed on the following terms with respect to the Castroygy Brook—that the people who derived their supply of water from it should be left to the course of the ordinary law if they proved any damage occasioned by the change in the circumstances brought about by the operation of the Bill. The clauses were subsequently settled in accordance with this decision.

SOUTHAMPTON CORPORATION WATER BILL.

This Bill, which was to enable the Southampton Corporation to acquire the undertaking of the South Hants Water-Works Company, and to construct works and supply water to the borough of Southampton and adjacent places, came before the Committee on the 17th inst. Mr. Balfour Browne, Q.C., Mr. Erskine Pollock, and Mr. Harper appeared for the Corporation; Mr. Pember, Q.C., Mr. Claude Baggallay, and Mr. Pember, jun., for the Company; and Mr. G. D. Fitzgerald, Q.C., Mr. H. White, Mr. Coxwell, and Mr. Harle represented various Local Authorities. Mr. Balfour Browne, in opening the case, set forth the objects of the Bill, and went on to state that in 1895, at an inquiry by the Local Government Board which led to the extension of the borough of Southampton, there were various complaints as to the charges of the South Hants Water Company. In consequence, the Corporation pledged themselves, if the borough was extended, to promote a Bill to buy up the Company's works, and in time, though this might not be done at once, to reduce the charge, so that throughout the borough there would be a uniform water-rate of 10d. in the pound on the assessable value. The pledge given by the Corporation no doubt weighed with the Local Government Board in consenting to the enlargement of the borough. The only way to carry out the pledge was to buy out the Company, because the Corporation had asked them if they would reduce the prices in the added districts of Shirley and Freemantle, where alone the Corporation were interested in the scale of charges. The Company refused, as they were justified in doing. As they would not do this, the Corporation asked their Lordships to say they should be allowed to purchase on fair terms; and fair terms were arbitration value for the whole. Shirley and Freemantle constituted the most lucrative part of the Company's undertaking; and the Corporation proposed to acquire it all, as it would not be fair to take away the most lucrative portion and leave the outlying districts, which were not remunerative. In answer to the Chairman, Mr. Balfour Browne said the Corporation could supply Shirley and Freemantle from their existing works; therefore it was not a question of the necessity of purchasing the Company's works for that purpose, or for supplying the town, which was already amply provided for. If the Committee thought the Corporation should only have power to supply the districts that had been added to Southampton, they would be willing to take them on arbitration terms. They would either take the whole or only the part consisting of Shirley and Freemantle. Evidence was given by Alderman Lemon, the Chairman of the Works Committee of the Southampton Corporation, who stated that the charge for water in the added area of the borough supplied by the Company worked out to 1s. 10d. in the pound, as compared with 10d. in the old portions of the town supplied by the Corporation. After some futher evidence, Mr. Pember addressed the Committee in opposition to the Bill. The Committee then consulted together, and the Chairman announced that they were of opinion that it was not desirable that the Bill should proceed.

HOUSE OF COMMONS COMMITTEE.

Tuesday, March 23.

(*Before Mr.* JEFFREYS, *Chairman, Mr.* VAUGHAN DAVIES, *Sir* CAMERON GULL, *and Mr.* D. FORD GODDARD.)

ASHFORD URBAN DISTRICT GAS BILL—ASHFORD GAS BILL.

To-day the Committee had before them the arrangement arrived at by the Ashford Urban District Council and the Gas Company for the acquisition of the property and business of the latter by the Council, in accordance with the understanding which was come to on Wednesday, the 10th inst. (see *ante*, p. 600).

Mr. CLAUDE BAGGALLAY (who, with Mr. FREEMAN, Q.C., represented the Company) said the end of the case, when the Committee had it before them on the previous occasion, was that certain heads of arrangement were come to between his clients and the Local Authority. These were read to the Committee by his learned friend; one of them being to the effect that the clauses for giving effect to the arrangement should be inserted in the Council's Bill, to be settled, in case of difference, by Mr. G. A. R. Fitzgerald. The Bill would then go on; and that of the Company be dropped. A difference did arise; and the disputed clauses went before Mr. Fitzgerald, who first of all settled them in a preliminary form, submitted them to both parties for comment and criticism, and then re-settled them in the form in which they now appeared in the Council's Bill. Mr. Fitzgerald also wrote that he had carefully considered the suggestions of both parties on his clause and alterations, and had made such arrangements as seemed to be requisite. "The Bill and clauses are now," Mr. Fitzgerald added, "finally settled and approved by me on behalf of both parties." He (Mr. Baggallay) did not mind telling the Committee that his clients had hoped to get more out of the clauses; but they held that, the agreement having been made in that room, it should be insisted upon, and Mr. Fitzgerald's award regarded as final—there should be no going back on what Mr. Fitzgerald thought was right. The Council proposed to introduce certain further modifications; and if they were allowed to do this, he should also ask to make alterations. But he said most distinctly it was the very essence of all parliamentary practice that parties should loyally abide by an arrangement to refer disputed points to a referee for decision, and should not try to upset that decision. Whatever the Company liked or disliked in the Bill, they were prepared to abide by Mr. Fitzgerald's award; and he did not think the Council should be allowed to do otherwise.

The CHAIRMAN, after a very brief consultation with his colleagues, announced that they could not hear debate on the desirability of altering Mr. Fitzgerald's decision, as it was arranged on the previous occasion that the matters in dispute should be decided by that gentlemen.

The clauses embodying the heads of agreement were then added to the Bill in the form in which they had left Mr. Fitzgerald's hands, with the insertion of a provision ensuring to the Company's Manager a pension equal to two-fifths of his salary on retiring; words, however, being added declaring that this should not apply unless the retirement was for physical disability or old age. With these recommendations, the Council's Bill was ordered to be reported; and the Company's Bill was withdrawn.

COMMITTEES ON UNOPPOSED BILLS.

The Taunton Gas Bill, which is to authorize the Taunton Gas Company to raise additional capital, and to issue new preference stock in respect of moneys expended on capital account out of revenue, came on the 16th inst. before the House of Lords Committee on unopposed Bills, presided over by the Earl of Morley. The Engineer and Secretary of the Company (Mr. A. Edwards) having proved the preamble of the Bill, the clause authorizing the Company to raise additional capital to the extent of £40,000, provided that they shall not create and issue within the year following the passing of the Act any greater nominal amount than shall be sufficient to produce £10,000, or within any subsequent year £5000, was passed without amendment. With regard to the clause in the original Bill which was to authorize the Company to create, in respect of moneys expended out of revenue on capital account, new stock to the amount of £3500, such stock to be deemed to be fully paid up, and entitled to a fixed perpetual preference dividend at 5 per cent. per annum, it was explained that they agreed to accept half the amount. The clause was accordingly altered to £1750. A new clause was introduced to provide that nothing in the Act should affect the priority of any previous debenture stock. A proviso was added to clause 26, which fixes the standard price of gas from the 30th of June next at 3s. 9d. per 1000 cubic feet for gas supplied within an area including the whole of the borough of Taunton and such other parts of the Company's limits of supply as are comprized within a square of one mile in each direction measured from the Market House, and 4s. 3d. per 1000 cubic feet beyond that area. The proviso enacts that no increased dividend in excess of the standard rate shall be paid in respect of any year during any portion of which the net price charged to a customer shall have amounted to 3s. 6d. per 1000 cubic feet within the square mile, or 4s. per 1000 cubic feet outside that area. A proviso was also added to clause 31, which fixes the quality of the gas at 15 candles, to the effect that within six months after the passing of the Act a testing-place shall be provided at the works of the Company. The Bill was then passed.

The Chichester Corporation Water Bill, which is to authorize the purchase of the undertaking of the Chichester Water Company by the Corporation, came on the 15th inst. under the consideration of the House of Commons Committee on Unopposed Bills, presided over by Mr. James Lowther. New clauses were sanctioned empowering the Corporation not only to let, but to sell meters, and calling upon the consumer to keep his own meter in repair if he elects to provide it. A clause has also been inserted allowing the water-rate to be charged on the rateable, instead of the gross rental value of the house. The Committee also granted sixty years within which to repay the loan. Mr. W. Smith, Chairman of the Water Company, explained that the purchase price had been based on the latest amount received for the shares at public auction—viz., £23 apiece. He added that last year the Company paid 8 per cent. dividend. The Committee passed the Bill.

The Disabilities of Parish Councils as Opponents of Bills.

The Tuxford and District Gas Bill, which is being promoted by a Syndicate of gentlemen in Nottinghamshire, has for its object the incorporation of a Company to acquire the undertaking of the Tuxford Gas Company, Limited, and to supply gas within their limits. The Tuxford Parish Council, regarding themselves as the local authority for the district, considered it their duty to petition against the Bill, in order to obtain the insertion of clauses requiring the Syndicate to limit the price of gas, fix a standard, and make provision that, should a future competent local authority desire to take over the works, they could do so in the usual way. The Council presented their proposed clauses; but the Syndicate objected to their *locus standi*. The matter recently came before the Court of Referees, when Mr. Shiress-Will, Q.C., supported the Council's claim for *locus standi*, and Mr. Freeman, Q.C., opposed. Mr. Shiress-Will submitted that the Parish Council stood in the position of a local authority; but the Chairman said that until it could be shown that the Watching and Lighting Act had been adopted, the Council had nothing to do with the matter. The Chairman of the Parish Council, who was present, was not in a position to say that the Act had been adopted by a parish meeting; and, without calling on Mr. Freeman, the Court decided that a Parish Council is not of right entitled to *locus standi*; and, moreover, they did not consider that such a Council came within the Standing Orders.

LEGAL INTELLIGENCE.

SUPREME COURT OF JUDICATURE—COURT OF APPEAL.

Thursday, March 25.

(*Before Lords Justices* LINDLEY, A. L. SMITH, *and* RIGBY.)

Jervis v. The Newcastle and Gateshead Water-Works Company.

This was an appeal by the plaintiffs, who are the Trustees of the Pawson Estates, in Northumberland, against the judgment of Mr. Justice North, on Nov. 3, 1896,* by which he held that the defendants were not bound to pay the £8000 odd awarded by the Umpire (Sir Jacob Wilson) in an arbitration between the plaintiffs and defendants, as compensation for compulsory purchase; but were entitled to a conveyance of the property on payment of £40,139—the amount which he had fixed as the value of the estate. It will be remembered that the defendants, being desirous of extending their works, went to Parliament in 1894 for further powers, and scheduled a portion of the plaintiffs' property. The plaintiffs opposed the Bill, and obtained the insertion of a section granting them power within two years to give notice to the defendants to purchase the whole of their estate. Such notice was given; and in default of agreement, the parties went to arbitration to fix the price. Sir J. Wilson was appointed Umpire; and he fixed the value of the property at £40,139, adding £8152 as compensation for compulsory purchase. The defendants then moved to set aside the award so far as the latter amount was concerned, or to refer it back to the Umpire for further consideration; but after the motion had been partially opened, Mr. Justice North thought it was not a convenient mode of trying the question. It was therefore arranged that an action for specific performance should be brought; and this was accordingly done by the plaintiffs. Mr. Justice North then held that it was not a compulsory sale on the part of the plaintiffs, but rather a compulsory purchase by the defendants; and that therefore the Umpire had no jurisdiction to award any compensation, on the footing of the plaintiffs being obliged to sell their property, beyond its fair price. Specific performance of the contract was therefore declared on payment of the smaller sum. The plaintiffs now asked that this decision on the construction of the Act might be reversed, and that specific performance of the contract at the price of £48,000 odd might be granted, or, in the alternative, that the action be dismissed with costs, leaving defendants to bring an action for specific performance if they desired, when various defences might be open to the present plaintiffs.

Mr. COZENS HARDY, Q.C., and Mr. BOYD, Q.C., appeared for the appellants; Mr. SWINFEN EADY, Q.C., and Mr. METHOLD represented the respondents.

In the result, their LORDSHIPS unanimously dismissed the appeal with costs—holding that the judgment of Mr. Justice North was correct in all respects; that it was not a compulsory sale by the plaintiffs, and therefore the Umpire had no jurisdiction to award the £8000 in respect thereof; but that in other respects his award was good and binding on the parties.

HIGH COURT OF JUSTICE—CHANCERY DIVISION.

Tuesday, March 23.

(*Before Mr. Justice* ROMER.)

The Automatic Coal-Gas Retort Company, Limited, v. The Mayor and Corporation of Salford.

Mr. MOULTON, Q.C., and Mr. WALTER appeared for the plaintiffs; Mr. BOUSFIELD, Q.C., Mr. ROGER WALLACE, Q.C., Mr. ASTBURY, Q.C., and Mr. ROE RYCROFT represented the defendants.

On the further hearing of this case (see *ante*, p. 663) to-day,

Mr. *James Swinburne*, was recalled on behalf of the defendants. He stated that he went down to Manchester on the previous Saturday, and saw there an apparatus rigged up in the form of a trough, with trucks arranged so that coal could be poured in at the top. The maximum angle of inclination he found was about 40°; and he said that above this the layer of coal would telescope. This was with coal ranging up to about three-quarters of an inch in size. He had very crude means to work with, and he let the coal drop slowly into the trough from a height. There was also a retort fixed up so that he might vary the angle of inclination.

Mr. BOUSFIELD: What was the result of your observations as to the conditions required for getting an even layer when the coal was started with, as nearly as possible, no initial velocity?

Witness: The essential thing is to get a uniform stream. You must not admit the coal too slowly, because if this is done the lumps of coal would go bouncing down the retort.

What must be the thickness of the stream compared with that of the layer you are to get?—One depends on the other. If a thin layer is run in, the lumps of coal will go one over the other; and when they come to the stationary coal they will run over it.

Could you get these conditions if you had a fall of the coal which gave it a considerable initial velocity?—No; I do not think you could, because the coal bounces a good deal, and a little lower down it does not run evenly. There is a sort of splashing. Witness further stated that where he dropped the coal from a height of 8 ft. 4 in. he got a thin layer; but at the bottom of the retort there was a heap occasioned by some coal running over the layer.

On being asked, when he allowed the coal to drop freely from a height, what were the conditions of inclination for obtaining an even layer, witness said they would naturally have a smaller angle and a uniformity of the stream of coal. If the retort were fed from a height, and the velocity of the coal were relied upon to carry it along the retort, they must have means to convert a vertical into a horizontal velocity. They could not possibly charge a horizontal retort by pouring coal down a shoot at an angle. They must have a curved shoot, so that the stream should be uniform. If they had a bend, they could get an even layer of coal in the retort if they ran in an even layer; but if the coal was run in unevenly, they would not. As they increased the angle, they diminished the drop, and finally had no drop; and this would be the angle defendants used. The more initial velocity, the less the angle required.

Mr. BOUSFIELD: Do you know whether practically horizontal retorts have been charged in this way?

Witness: They have been so charged somewhere in the Midlands.

Supposing an angle of 32° and a drop of 8 feet, what would be the result?—You would get a thick layer at the bottom of the retort, which would be charged unevenly.

Do you know the practical thickness for working in a retort?—About 6 inches. The ordinary retort is about 16 inches from crown to base. Though it is usual to work with a layer 6 inches thick, it could be varied about an inch. If the layer were made thicker, trouble would arise.

In further examination, witness said that in his experiments an ordinary Ω-shaped retort, 18 feet long, was used; and 6 cwt. of coal was the usual charge, and the angle, he believed, 32°. He made four tests at Salford by dropping charges of coal through a bent mouthpiece from different heights. In the first case, he used a height of 8 ft. 4 in., and took a charge of 6 cwt.; and the men poured in as slowly and evenly as they could. The result was that, though the layer was uniform for about 3 feet from the bottom, it was too thick for practical purposes, and it became thin on the top, and stopped 8 feet from the top end of the retort. He then tried a drop of 3 ft. 9 in. The result was that a much more even layer was formed; and it came within 5 feet of the top. Then he had a piece of wood nailed across the spout, and he obtained a better layer up to 5 feet from the top. He next dropped the coal from the spout, with the piece of wood nailed on it, at a height of 8 ft. 4 in.; and he got a fairly even layer within 5 ft. 4 in. of the top. When he put the piece of wood on the spout, it was a crude imitation of what the defendants were doing; but it secured a uniform stream.

Cross-examined by Mr. WALTER: The maximum angle at which he could obtain repose was 40°. After that the coal telescoped. The retort could not be worked practically at that angle. About 32° to 34°, or perhaps 35°, was the practical angle. As far as the regulation of the coal was concerned in his experiments, it was in the hands of three workmen. An even layer might be produced by coal dropping down a shoot with a door to it, like that in the plaintiffs' model; but the great thing was to produce an even stream of coal going into the retort.

Re-examined by Mr. BOUSFIELD: The men who tipped the coal into the shoot were acting under his instructions. When once the idea of a uniform stream was suggested, there was no difficulty in finding the means of getting it. The door formed an important part of the shoot, as by its means a uniform stream was obtained. In an arrangement like that shown in the model of plaintiffs' patent, if the coal was put in without initial velocity, the result would be that they would get a different thickness of layer.

Mr. *W. Gadd*, a civil engineer and patent agent, said he had been in practice for the past 36 years. For a long time he had made a special study of matters relating to gas engineering, and was the inventor of different appliances connected therewith. He had carefully examined M. Coze's specification, and also those relied upon by way of anticipation; and he was familiar with the state of public knowledge in reference to these retorts and the making of gas at the date of the plaintiffs' specification. In his opinion, the defendants' apparatus did not contain the essential features of M. Coze's invention. The prolonged charging mouth brought up to the level of the truck was essential to his invention, because he wanted to charge from the line of rails; and in his illustrations he showed how it could be done in every case. There was no suggestion, either in the letterpress or the figures, that his apparatus was to be used without it. He relied upon the vertical fall which this prolonged mouthpiece would necessarily give, whereas the defendants did not discharge from one level.

Mr. ASTBURY: Take fig. 14 of M. Coze's specification, is that figure suitable to be applied to such figures as Nos. 1 and 3, where all the mouths are brought up to one level, and where the hoppers are to be placed upon them for the purpose of charging one retort at a time?

Witness: Yes; that is so.

In the specification and drawings, do you find any suggestion that fig. 14 is for no other purpose than for a double charge to be effected at one time?—No; the only reference I find in the text is: "Fig. 14 shows a series of fixed hoppers, for enabling one or more retorts to be charged at one time." It is simply a substitution for a tipping truck.

Do you, as a gas engineer, find any suggestions or direction that it is advisable to have a uniform stream into the charging mouth?—On the contrary, for if you look at the top of page 6 of the specification, you will find that "the charging of each retort is, in this manner, instantly effected."

And do you further find that there are specific directions for placing

* See "JOURNAL," Vol. LXVIII., p. 911.

the retort at an angle less than the angle of repose for the purpose of utilizing this fall into the charging mouth?—Yes; it says "aided by the inclination."

With regard to the state of knowledge at the time of the specification, where horizontal retorts were used, what sort of layer was it necessary for the coal to assume at the bottom of the retort for the purpose of gas making?—A uniform layer covering the retort from end to end. That was recognized as being essential. In 1885, no one would fill a retort; it would be fatal to gas making.

The learned Counsel next took witness through the specifications of Newton, Griffiths, and Carey; and witness said the essentials of success were shown in them.

In further examination, witness detailed a number of experiments he had made, in company with Mr. Newbigging and Mr. Shoubridge, with retorts measuring 11 ft. 6 in. long, and charged with 4 cwt. of coal. These measurements were the same as those of M. Coze. Coal was carefully tipped from a height of 8 ft. 4 in. into a retort placed at an angle of 31°. When the coal was tipped slowly, it filled the retort for a distance of 7 ft. 6 in. from the bottom in a thick layer, and left 4 feet blank. Tipping it fast, the coal only covered 6 feet of the retort. Making the same experiment with a 6-feet fall, the coal leaped over the stop at the bottom of the retort. He then experimented with a retort placed at an angle of 26°, which was less than the angle of repose of coal on coal. With a fall of 8 ft. 4 in., with careful tipping, 2 ft. 9 in. of the retort was left uncovered. At the same height, going to a retort set at an angle of 23° and tipping quickly, 2 ft. 3 in. was uncovered. At this angle, the coke would not be discharged; and at 26° very little came down by removing the stop. He carried out some similar experiments with the retorts in use by the defendant Corporation. They were in practical working order. He opened the trap-door on the defendants' measuring chamber 10 inches, and passed fine coal, which covered the whole retort. With large coal, the door was opened 10 inches; and it made a fairly even layer—leaving uncovered 3 ft. 7 in. out of the 18 feet. But in practice the door was only opened 6 inches with large coal. When the door was so opened, a perfectly even layer was made. He opened the door 6 inches, and used fine coal; and a thin layer was made over the whole of the retort. But 1 cwt. of the coal did not enter the retort. He did not think the defendants used any "combination of inclined retorts with bent charging-mouths forming prolongations of the retorts."

Mr. ASTBURY: Do they use a "combination of inclined retorts and bent charging-mouths of the form shown and described" in the plaintiff's specification.

Witness: No; nor in any of its figures. The defendants in their apparatus do not make use of any vertical fall of coal in the charging apparatus, for the purpose of assisting to create the layer of coal in the retort. In my opinion, it is essential, for the proper working of inclined retorts, that the initial velocity should be reduced to a minimum. Otherwise there is trouble with the different classes of coal and different kinds of tipping.

If you are making use of the initial velocity created by the fall of coal, does success or failure then depend upon the intelligence and skill with which the coal is fed in?—Yes; but all the intelligence and skill in the world would not do away with what I have described.

In the defendants' apparatus, are the retorts fed by trucks running at the same level as the mouths of the shoots, as described in the plaintiffs' specification?—No; and it is essential to the success of defendants' apparatus that they should not be so.

Cross-examined by Mr. WALTER, witness said he had never worked in a gas factory practically. He found in the plaintiffs' specification a vessel containing coal charged by gravity down a shoot, *plus* gravitation fall. Then it fell on the shoot, which entered the mouth of the retort. At the bottom of the retort there was a stop. The coal ran down to the stop, and gradually extended up. In the experiments made with defendants' apparatus, the coal did not come up to the level of the top of the retort. There was no increase in the initial velocity when the door of the measuring chamber was opened wider. If the valve was opened more than a right angle, the initial velocity would be increased.

Mr. *George Livesey*, examined by Mr. BOUSFIELD, said he had had experience with inclined retorts the past few years, and, as a matter of fact, had paid some royalties for their use to the representatives of M. Coze. The first inclined retorts put up at the South Metropolitan Gas-Works were made according to M. Coze's specification, with the iron prolongation; but, after working it a short time, they found it to be impracticable, and stopped it. He had heard Mr. Swinburne's evidence that morning, to the effect that a uniform stream was the one condition essential for getting a uniform layer; and he thought it was essential.

Mr. BOUSFIELD: How long have you, as a gas engineer, known inclined retorts?

Witness: Certainly for twenty years I have known the idea of inclined retorts; but I never thought it was worth while to carry it out in practice, because it would require the pulling down of the whole of the retort-houses. The expense would be very heavy; and until 1889 there was no reason why, beyond saving labour, they should do that. In 1889, however, there came the great outbreak of Trade Unions; and then mechanical appliances were introduced. Practically nothing came of them until gas companies were forced to use them in order to render themselves free from the Unions. This is the reason why inclined retorts were not adopted before 1889. I discussed the matter with Mr. Woodall at least twenty years ago. I was considering whether I should use them for the South Metropolitan Gas Company. I have read Coze's specification, and also that of Newton.

In your opinion, has M. Coze given to the world any knowledge or information in his specification?—The only way I think he has done anything in that way is that he put the idea into practice; but so far as the idea is concerned, there is nothing new in the specification.

As regards practical directions for working out the system of inclined retorts, are his views of any value?—I should not like to say they were of no value, because I think they were the starting-point from which engineers have worked up to their present position. I was not prepared to adopt Coze's plan; and it was only when Mr. Braidwood invented his method of tipping the coal that we tried Coze's system. Mr. Braidwood invented a piston with an air cylinder on the coal-truck; and the air could escape at any rate of speed the workman liked, so that the tipping could be regulated.

Taking the Coze specification as it stands, is there described therein a system of charging inclined retorts which would be practically successful?—No; I do not think so.

Is there anything about the desirability of having a uniform stream of coal?—I do not remember it.

Have you found it necessary to make any other variation in order to render inclined retorts practically workable?—We had to abandon the iron prolongation of the retort; and we substituted a moving shoot with baffle-plates. To meet the difficulty of angle, the lower retorts were set at a flatter angle than the higher ones, because Mr. Braidwood did not destroy altogether the velocity of the coal. If you like, you can charge horizontal retorts by dropping coal round a bent shoot; but you could not get the coke out, except in the ordinary way. In Newton's specification, there is the idea of inclined retorts, and there are also the rails and the trucks; but these are subsidiary. The idea of inclined retorts is clearly set out in Newton's specification.

With regard to the question of getting the coke out after it is made, at what angle ought the retort to be?—The greater the angle, the easier it is to get out the coke; and getting the coke out is quite as important, or even more so, as getting the coal in. I have seen how the difficulties in the use of inclined retorts have been overcome by the defendants. The delivery of their coal is at right angles to the shoot; and they get over the difficulty of delivering their coal at a velocity.

Cross-examined by Mr. WALTER: The South Metropolitan Gas Company were licensees under the Coze patent. They had a series of inclined retorts with the iron prolonged charging-mouths. So far as the charging was concerned, it was performed evenly over the floor of the retort by means of Mr. Braidwood's method. With regard to the various alterations made, practically every gas engineer made changes in his apparatus; but it did not happen in the present case. The only difficulty which arose from the prolonged iron mouths was that tar became clogged in the bend, and the coal stopped them up. He should not be there if the Salford people had not offered what seemed to be a reasonable royalty to the plaintiffs.

Mr. BOUSFIELD: Why did you pay a royalty?

Witness: Because a personal friend was interested in it, and came and asked us to do so. I did not believe there was any patent in inclined retorts; but we paid £1 a retort. Now a very high figure is asked.

Mr. *Corbet Woodall*, examined by Mr. ASTBURY, stated that he had been familiar with inclined retorts ever since the Carpenter patent, which was taken out about twenty years ago. He saw the arrangement at work. The retort was set at rather a flat incline—flatter than the angle of repose. He had read the plaintiffs' specification, and was familiar with the method of use. If the angle of the retort was suitable, the fall in the charging-mouth was not only unnecessary but injurious. The experience of all who had used it had inclined them to that view. He thought the bent charging-mouth had been done away with where ingenious appliances had been invented to nullify the effect, The result of adopting defendants' plan was to bring the coal practically to the mouth of the retort without any added velocity other than the mere drop of the coal. In Coze's installation as at present working, appliances of one sort or another had been produced in order to break the fall from the charging-mouth.

Mr. ASTBURY: When you have a fall of 8 feet, what sort of angle would you require to have the retort at, compared with the angle of coal on the substance of the retort?

Witness: Very much flatter than the angle of repose. In one of the works in Berlin, the Engineer had the idea that he could charge horizontal retorts by vertical fall; and a shoot was put up at a height of from 12 to 14 feet. Down that shoot, which was slightly inclined to the vertical, the coal was shot; and retorts 10 feet long were charged perfectly and uniformally from end to end—as good as any charge I have ever seen.

Justice ROMER: You were rather astonished at the result, were you not?

Witness: No; I was not, for the method of charging had been spoken of for a long time; and it would have been put into practical working order if there had not been a dispute as to patents.

Mr. ASTBURY: In your view, when you have a fall down a shoot, has the question of getting a uniform layer in the retort anything to do with the angle of repose?

Witness: I do not think it has; and the experiments detailed by Mr. Swinburne prove that. I have made similar experiments myself at Salford; and I made some last Saturday at the Tottenham Gas-Works, which showed that the velocity must be varied to have a uniform layer.

What is the chief condition of success in getting a uniform layer in a retort?—That the angle must be suited to the character of the coal used, or that the velocity of the entering coal must be suited to it. The patent does not show any method of dealing with these characteristics of coal. It is essential for practical success that arrangements should be made to meet the cases of different sizes of coal.

In cross-examination by Mr. WALTER, witness acknowledged that in the case of a horizontal retort it was not possible to get any coke out without raking.

Mr. *J. F. Braidwood*, the Manager of the West Greenwich works of the South Metropolitan Gas Company, said that in the year 1890 he had certain retorts put up on the Coze system. They were erected in accordance with fig. 1 of the specification, and set at an angle of about 36°; but after working them for three weeks, the pipes became blocked, and operations were discontinued. When the coal was run into the retort, the layer was fairly even; but it was thicker at the bottom, and tapered off to the top.

Justice ROMER: Therefore if the angle was less than 36°, it might be level all up?

Witness: Not necessarily.

Examination continued: He superintended the erection of the retorts; and the angle was fixed at 36° in order to facilitate the discharge of the coke. He took away the mouthpiece when the pipes were choked, and placed a shoot with baffle-plates to retard the delivery of the coal into the retort. The layer they got at the bottom, with a mouthpiece made according to Coze, was about 8 inches thick, which was too much for practical working. He designed a truck on the pneumatic system; and as it was necessary for success to have the stream of coal uniform, the truck permitted this. In his opinion, the weight of coal in charging the retorts would not allow a workman to regulate the flow without such a truck as he had designed. At Salford, the system was not the same as that of the plaintiffs.

Cross-examined: He had two trial retorts set back to back; and the difficulty he found was that the upright vertical shoot became filled up. If the retort was placed at an angle of 30°, the three tiers of retorts would not have layers exactly similar.

Mr. *Charles Hunt*, the Engineer of the Windsor Street station of the Birmingham Corporation, said that they had a system of inclined retorts at work at Birmingham. They had a travelling hopper, raised and lowered by hydraulic power, which was fed by an overhead hopper; and the shoot was put into the retort. The retorts were placed at an angle of 29°; and the stream of coal was regulated by a cut-off in the bottom of the hopper. This cut-off was opened or closed according to the class of coal used. It was in a horizontal line. The coal was delivered 5 or 6 feet from the floor of the retort by means of a long bend. He was well acquainted with the different classes of apparatus in use at most of the large gas-works in England; but he did not know of any successful installation where retorts had been fed from different heights with a vertical fall.

Cross-examined: He went to Rheims with several other engineers, in 1889, to inspect the Coze system. He was pleased with what he saw; and the Birmingham Corporation were licensees of the plaintiffs. In the retorts as originally put in at Birmingham, they were at an angle of 29°; and they had a fair distribution of coal. They made several alterations from time to time.

Re-examined: He took out a patent for the moveable hopper, which was not in Coze's specification. The defendants' charging apparatus was entirely different from that of Coze.

Mr. *J. P. Leather*, the Gas Engineer of the Burnley Corporation, said he had an installation of inclined retorts put up in 1890 and 1891. It was on Morris and Van Vestrant's modified system. As it was at first erected, there were no baffle-plates; and it was not practically workable. The top retorts were sometimes successfully charged; but the other two tiers could not be charged so as to be practically useful. The men attempted to regulate the slide; but it required considerable skill. There was no slide in Coze's specification. In fig. 23, there was a trap. In his opinion, the arrangements illustrated in Coze's specification would not produce practical results.

Cross-examined: The Burnley Corporation had paid royalties to the plaintiffs. As time went on, the men became more skilful; and they now obtained a better result than in 1891.

Re-examined: They did not now use any shoots without the baffle-plates and checks.

Mr. *T. O. Paterson*, the Gas Engineer of the Birkenhead Corporation, said that in 1890 his Gas Committee put up four settings of retorts on the Coze system. They were experimenting with these from July, 1891, to February, 1892, when they stopped working. The retorts had now been removed. As a practical gas engineer, he said the installation was a failure. The bent mouths were set in the brickwork, and became very hot. Then an obstruction was formed, and the shoots choked up. With regard to getting a uniform layer, it was even when the men became skilled in the work, so long as the bends kept clean. The drop in the bottom tier of retorts was 8 feet. The tendency was for the charge to fill up the bottom of the retort, and be light at the top. The result was that the gas production was not good.

Cross-examined: Birkenhead had paid royalties. As long as the bends were open, a fairly uniform layer could be obtained.

Mr. *W. T. Carpenter* said he was the Manager of the Sheerness Gas-Works. He took out certain provisional specifications in 1869, and made a conical retort 8 feet long, 1 foot in diameter at the charged end, and 2 feet at the delivery end. It was inclined about 30°. He experimented with it as a labour-saving appliance; and he came to the conclusion that the angle was a suitable one, because only slight pressure was required to push the coke out. After this he erected at Sheerness a bench of retorts similar to the illustration in the "JOURNAL OF GAS LIGHTING" for Aug. 6, 1878; and he read a paper on the subject before the British Association of Gas Managers. He had an archimedean screw which was used for effecting continuous carbonization. This system was an efficient one. He meant by the phrase in his paper that his system had "gravity for its principle," that the coal had to slide down the incline. Mr. Woodall saw the bench of retorts in operation.

Cross-examined: The patent was taken out in 1878; and the retorts had never been used since.

Mr. *S. Y. Shoubridge*, examined by Mr. BOUSFIELD, said he was the Gas Engineer of the defendant Corporation; and he worked out the details of their installation of inclined retorts. The model which had been put in showed the apparatus. He found that there were practical difficulties to be overcome in the Coze specification.

Mr. BOUSFIELD: In getting over these difficulties, would any ideas that were in Coze's specification be of assistance to you?

Witness: In my opinion, they would not, because the method of charging described in that specification tends to an uneven distribution of coal in the retort. I find I cannot get an even distribution above an angle of 23° with the 8 ft. 4 in. drop; and at that angle, I cannot get a proper discharge.

But with that drop at the angle of 29°?—The coal then went down to the bottom of the retort, and left a considerable blank space at the top.

Justice ROMER: It is very odd. Mr. Paterson worked it all right.

Mr. BOUSFIELD said he could produce evidence of dozens of experiments having been made.

Justice ROMER replied that they must take the evidence altogether.

Witness said it was quite contrary to his experience.

In further examination, he said the lumps of coal were in cubes of about 1¼ inches; and they had a truck which was tipped at first as slowly as a man could do it, and then rapidly. He found that by tipping slowly they got a worse distribution of coal than by doing it rapidly.

Justice ROMER remarked that witness wanted a medium.

Witness said that was so; the lumps of coal jumped down the retort.

Examination continued: If they put the coal in all at once, it would make a thick layer at the bottom. He knew that fine coal would lie at a steeper angle. In working according to the plaintiffs' specification, they must have an angle less than that of repose. They had now a greater angle than that; and the result was that immediately the stop was removed, the coke discharged itself. Supposing at 32° they were to drop coal, as the plaintiffs did, down a shoot 8 ft. 4 in. high, there would be a very thick layer at the bottom of the retort, while part of the upper portion would remain uncovered. The result would be that the illuminating power of the gas would be deteriorated. If the layer were too thick, the yield of gas would be greatly diminished; and the coal would jam against the arch of the retort as the material swelled during carbonization.

Mr. BOUSFIELD: So far as the plaintiffs' specification gives practical details for charging an inclined retort, did those details help to a successful result?

Witness: No; on the contrary.

Have you seen installations which have been erected according to Coze's specification, without any additional baffle-plates or means of regulating the flow of coal?—Yes; I saw them at Southall, Kensal Green, and Nine Elms. They were failures in each case.

Cross-examined by Mr. WALTER: He went down to Southall, and saw the works. He wrote to the plaintiff Company in January, 1891, saying that there was a great future for their carbonizing plant. In 1892 he again wrote, asking what the terms for royalty would be on 256 retorts; and in February of the same year, he had the answer. But the terms were so prohibitory that the Corporation put up their present system.

Mr. WALTER: Do you suggest that the Southall installation was not a working system?

Witness: I say it was a failure. I think the Engineer did not agree with it, because he did not put in any more retorts.

Justice ROMER: That is argument only.

Mr. WALTER: You have a travelling hopper running on rails at one level charged from a series of fixed bins above, and the floor is arranged on different levels?

Witness: Yes; it has made the system a success. It was a radical improvement.

You have a door at the bottom of the measuring vessel?—Yes; it was one of the great principles of the design. The coal is delivered at the inclined shoot, and flows down the retort.

Re-examined: The defendants were disposed to pay a royalty because they thought they would use Morris and Van Vestrant's patents, which made the thing a practical success.

This closed the evidence.

Justice ROMER said he wished to follow the point raised by defendants Counsel. Was it that the plaintiff's specification as it stood could not be worked practically and successfully?

Mr. BOUSFIELD replied in the affirmative. He did not say they could not get a uniform layer in a particular case with a certain kind of coal by special regulation and by opening the slide. The idea was that, by taking the apparatus as it stood, they could not deal with the problem.

Justice ROMER thought the evidence went to this: Take fig. 1. Possibly if they tipped the contents of the waggons down the shoot, they would not get a satisfactory result; but they might get something more satisfactory if they had a special coal. Still the thing might have been of use. He agreed there had been great improvements in working, and that possibly but for those the patent would not be the success it was. Was it not a stride—the main idea, from which all the improvements had come?

Mr. BOUSFIELD said he must concede to M. Coze that he had rescued from oblivion the idea of inclined retorts.

Justice ROMER said he did not agree with anticipation at all. Inclined retorts were known, or rather suggested. There was Carpenter's; but it did not lead to anything.

Mr. BOUSFIELD urged that Mr. Livesey had explained this. Besides, the plaintiffs' specification was taken out in 1885, and nothing was done until 1891.

Justice ROMER said he wanted to be certain that he followed the learned Counsel's point. Was it said that fig. 1 would not lead to any practical results.

Mr. BOUSFIELD said a patent could not be taken out for inclined retorts. It was open to anybody to fix a retort at an angle of 30°, and to fill it by putting in the coal with a shovel, and work it so. Therefore all they could have a patent for was for certain apparatus for charging inclined retorts.

Justice ROMER: And discharging, because the apparatus discharges.

Mr. BOUSFIELD contended that the old patents for inclined retorts spoke of gravity for discharging. The scope left for invention was practically to devise some plan for automatically filling retorts with a proper layer of coal. His point was that there were difficulties to be solved; and unless this was done in a practical manner, they could not have a valid patent. This being the whole area open to him, M. Coze had failed there. Had he pointed out a successful method of doing what was wanted? The defendants submitted that he had made a complete error on the point.

Justice ROMER: The point you make about the angle of repose is that he always indicates a certain angle less than that.

Mr. BOUSFIELD said it was less than the angle of repose of coal in a retort. When they were dealing with a system in which the coal was dropped from a height, the angle of repose had nothing to do with it. This angle limited the upmost point to which they could incline their material. Mr. Woodall had, in fact, seen in Berlin a method of charging horizontal retorts by means of shoots in which the coal fell from a height. This showed perfectly well that the conditions which M. Coze thought were needed for making a uniform layer had nothing whatever to do with it; it showed, in fact, that the thing could be done in the same way with a retort quite flat without the slightest variation, except that the coal was dropped from a greater height. There was a difference of principle between the plaintiffs' and defendants' arrangements. Instead of being on one side of the angle of repose, the defendants were on the other; and that angle marked sharply the difference of the two systems. The theory and practice of the plaintiffs' specification led to failure. The defendants adopted an entirely different theory; and that being so, it was impossible that they could be within Coze's claim. He had in his opening referred his Lordship to the prior knowledge. Griffiths and Carey showed an inclined retort set at an angle. He submitted that the defendants were entitled to do what Griffiths and Carey had done, and contended that they had invented a machine for charging such a retort as those inventors had made.

Mr. WALTER commenced to reply on behalf of the plaintiffs, when

Justice ROMER stopped him, and proceeded to give judgment. He said that, in his opinion, the plaintiffs were entitled to succeed. He thought the invention of the patentee was a novel and a very useful one, and was undoubtedly good subject-matter for a patent. In substance, it was for

new apparatus for making gas from coal. It could be applied for analogous purposes; and accordingly the claim was for "improvements in retorts for the distillation of gas from coal and other matters." But undoubtedly the chief object of the patent was the manufacture of gas from coal. Now, prior to the date of the invention, the system in use was one in which the retorts were placed horizontally. This position was adopted because it was very important, in the manufacture of gas, that the coal at the bottom of the retort should be lying substantially on the level, and be not too deep, so that there would be sufficient room for it, when heated, to expand, and yet leave sufficient space for the gas to pass off to the top of the retort. With horizontal retorts, the system of charging and discharging them was a very laborious one, and, as he gathered, required considerable skill on the part of the men who were entrusted with the duty. It required several men to do it; and it was comparatively slow work. The patentee's apparatus, or system, depended upon this: He took a retort at an angle approximating to that which he called the "angle of repose." As to this, he (the learned Judge) did not think there was much difficulty in seeing what the patentee meant. He meant at such an angle that when the coal was allowed to fall from the truck into the bent charging-mouth, it would enter the retort at a certain velocity, and then distribute itself in a practically even layer over the bottom. As the coal entered, it went down the retort, and reached the stop which the patentee pointed out was to be used. It then impinged upon it, and the retort became charged with a layer of coal which was sufficiently level, and of the right height to be capable of being dealt with in the ordinary way. The advantages of the system were these: In the first place, it dispensed with labour, and was much cheaper than the usual method; secondly, the charging was substantially automatic, and the discharging was effected with great rapidity owing to the angle. The patentee showed a great many detail ways of carrying out his invention. Among other ordinary things he mentioned were the employment of hoppers for certain purposes, a moveable shoot, and shoots of different shapes. The worth of the invention was shown by his system, from the time of its coming into use, practically entirely superseding the old one; and accordingly, so valuable was it, that, as usually happened in inventions of this kind, from time to time numerous modifications and improvements had been made. Some of these were for the use of moveable shoes and baffle-plates, to steady the supply of coal to the retort; and there were various devices for making the supply constant and regular, for diminishing the drop, and for slightly increasing the angle of the retort referred to in the specification. So valuable was Coze's original invention, that many of these modifications had become so important as to deserve patents being taken out for them separately. To his mind, the novelty of the patentee's invention was very clear. Never before the date of the patent had any such apparatus or system been used for distilling gas from coal or any other heated matters. When the alleged anticipations were examined carefully, they were found to be in reality not anticipations. All they showed was that inclined retorts had for some purposes been used prior to the date of the plaintiffs' patent. He would refer to one or two of the important anticipations. He might say generally with regard to them that none showed how to produce on the bed of the retort an even distribution of coal or other substance, or considered or had regard to the advantages obtained by the patentee's invention. Take Newton's specification, for example. In this case, the angle of the retort was substantially different from Coze's; it was about 45°. Coze's system was not only not shown, but was evidently not known to Newton; and certainly from him no one would be led to Coze's invention. Newton's invention would not, to his Lordship's mind, work on Coze's system, and would not produce such a layer of coal as was required for the purpose of manufacture according to the method of Coze, and generally adopted. As to Griffiths's patent, which referred to the case of a retort used for the purpose of oil extraction, there the system of having an even layer was not required at all; nor was Coze's system pointed out in the slightest degree. Griffiths had, in fact, a horizontal retort with a slanting supply; and in no sense could it be called an anticipation of Coze's invention. To pass on to Carey, whose apparatus was for calcining bones, that was a system where no uniform layer at the bottom was required. It was not pointed out by Carey; and it was sufficient for him (his Lordship) to say that there was not the slightest indication of Coze's system—nothing in it which would lead anyone knowing Carey to the view of Coze's system for the distillation of coal. The angle of 32½° was used by Carey for very different purposes. He wanted it for the re-burning of charcoal. With regard to Wilson, he need only say that the angle he had tried was clearly one wholly outside Coze's invention. It was something under 60°; and that was about the angle he had shown in his drawings. No layer at the bottom of the retort was pointed out, nor was Coze's system in the slightest degree anticipated. Moreover, in his opinion, it would not work; and certainly it would not do so for the patentee's system. With regard to Carpenter's specification and his paper in the "Journal of Gas Lighting," his invention was a very different thing from that of Coze. It was not only not the Coze system, but it would not have led to that system. Indeed, it was practically obvious that it would not; for, though Carpenter's invention was known many years ago, and was tried for a certain period, it soon fell into disuse, and no one was ever led by it for one moment to anticipate Coze's invention. In Carpenter's system, the coal was really made to enter the retort by pressure of screws, so as to cause a continuous motion. It had nothing to do with an automatic retort or the Coze system of charging. He thought, therefore, it was abundantly clear that there was no anticipation of Coze's invention; and in his (Justice Romer's) opinion, his specification was sufficient to enable any person desirous of doing so to carry it out. The defendants said that the invention as set forth in the specification would not work so as to be a practical success. Upon this point there had been evidence of a somewhat conflicting nature. To his mind, taking fig. 1 alone, which was the patentee's primitive invention, it could be worked, but not so usefully or successfully, especially when a coal of mixed size was employed, as when the invention was used in connection with the other details. The patentee had really taken great care to explain in his specification the objects he desired to effect, and the means of effecting them; and he (his Lordship) thought it was not expecting too much for him to anticipate that there would be reasonable skill and care on the part of the workmen to carry out his invention. The special ground taken by the defendants' objection to fig. 1 and the patentee's invention generally, was that it would not produce a good even layer of coal when they took the extent of fall of the shoot shown in the specification, and the angle of the retort (that shown in fig. 1 was approximately 29°). But it was perfectly clear that they could, if reasonable care was taken in seeing that the coal left the truck not in a great rush or slowly, but in substantially a continuous stream, practically carry out the patentee's invention so as to be very useful and a substantial success. Among other evidence which supported the defendants' view, he bore in mind what Mr. Swinburne said. He stated that it would be perfectly easy to secure a continuity of supply if it was seen to be desirable to have it. He (his Lordship) could not think that the desirability of having a continuity of supply from the waggon was something which was not obvious, and which ought to be specially referred to in the specification. Look at the care that was taken by the patentee to show what the result was. For example, he said there were many things to be considered. The angle of the retort, the velocity of the coal, the friction arising from the floor of the retort, the size of the coal, and so on. He specially referred to the portions of the complete specification set forth; and he need not refer to them in his judgment. He found, as a matter of fact, that the desirability of this particular supply of coal struck most people who had practically to work out the patentee's invention. And the evidence of Mr. Paterson was very noticeable, that he took fig. 1 and worked it, and found that the charge was in every respect satisfactory. As a matter of course, he took care that his workmen should supply the coal in suitable sizes. He thought, indeed, everybody knew that, in order to ensure success, care should be taken as to the way in which the coal was supplied to the shoot. With regard to the special difficulty in fig. 1, it really concerned the shoot being built round by brickwork. The effect of this was that the heat had a tendency to block up the mouth of the shoot, by reason of the accumulation of tarry matter. No doubt this drawback did interfere with the value of the invention. But such a disadvantage ought to be set off against the advantages derived from the system. Because of it, he could not hold that the invention was wholly bad. Some people might prefer to use fig. 1 in spite of its disadvantages. It therefore appeared to him that this objection on the part of the defendants failed. He had already pointed out that the invention worked better and more successfully with the other arrangements as shown in the specification, such as fig. 14, and more especially with the improvements and modifications he had already indicated. But the fact that the invention, as now practically used, was the one with the subsequent modifications did not prove that the original invention was not useful; and the use of it with modifications did not enable the user to say he had not taken the benefit of it and infringed. It was said that the angle of repose of coke was, as a rule, slightly greater than that of coal, and that the angle of repose of coal would not enable the coke to be got out. But the difference of the angle between coke and coal was not very great; and practically, if they had such an angle as the patentee pointed out was useful for the purpose of charging, it would be so for the purpose of discharging also. It was further said that the patentee only pointed to an angle of 29°; or, at any rate, not to a greater angle than this. But the patentee, in his specification, showed what he was thinking of. He had the inclined retort; and he wished to have the coal entering at the top of it with some velocity, to be caught by the stop, and then accumulated; and he wanted his angle to be such as to have these advantages. They could work the patentee's invention with an angle slightly above or slightly below the 29° mentioned in the specification. He had taken care not to limit himself to one hard-and-fast angle; but he pointed out that it was approximately that of repose. It was said that Newton's arrangement, with an angle of 32°, was practically the same, with not so big a fall. Very likely this was so. But substantially the patentee's invention was still there. He therefore held that the objections to the patent failed; and it only remained for him to consider the question of infringement. If they once looked at the defendants' model apparatus, and saw how it worked, the thing was at an end. They had made, he admitted, improvements in the details of carrying out Coze's invention. They might be useful modifications and improvements; but when the apparatus was looked at, it appeared to him impossible to say that they had not adopted the plaintiffs' system. In his opinion, they had done so. The defendants' apparatus was nothing more than the plaintiffs' system, with modifications. It would never have come into operation if it had not been for the patentee's invention. Their angle was 32°; but it was clear that this was not outside the invention. In addition to having a slightly increased angle, the defendants had a very modified drop. The velocity with which the coal went into the mouth of the retort from the defendants' shoot was less than it was in the arrangements shown in the patentee's fig. 1; and he had no doubt, as he had said, that the defendants' modifications were very useful for the purpose of regulating the velocity of the coal, according to its size, so as to ensure its being more evenly distributed over the floor of the retort. But the defendants had taken the whole of the patentee's real invention; and all their invention fell within claim 1. They took the system and carried it out according to the details, subject to certain modifications. It was attempted to be suggested by some witnesses that in the defendants' arrangement there was no fall of the coal into the mouth of the retort; but such a suggestion was really absurd. There was such a fall, effected substantially in the same way by the operation of gravity, for the purpose of getting a certain velocity upon the coal, so as to allow it to fall down the retort, and form an even layer at the bottom. It appeared to him, therefore, not only that the patent was valid, but that the defendants had infringed it.

Mr. Moulton asked for judgment for the plaintiffs, with costs, and an injunction; and he said the plaintiffs would take an account of profits instead of an inquiry as to damages.

Justice Romer said he would consider that matter on the following morning.

Wednesday, March 24.

On the subject being mentioned to-day,

Justice Romer said he earnestly hoped the plaintiffs would not take an account of the profits in this case. It would lead to the greatest possible difficulty in Chambers, and to enormous expense.

Mr. Moulton said what he should advise his clients to do was to state to the defendants the royalty they would accept to free the retorts. It should be a proper royalty, which would be taken as an account of damages.

Justice Romer said, if he might speak plainly, the plaintiffs ought not, with a view of putting pressure on the defendants, to take an account of profits with a hope of saying to them: "If you do not accede to our terms as to royalties, we will go on."

Mr. Moulton: We will propose a sum.

Justice Romer: Do that out of Court. I propose that you should take an inquiry as to damages.

Mr. Moulton said he should have thought that, if the cost of carbonizing a ton of coal was reduced so much by the plaintiffs' process, the account of profits would be easily ascertainable.

Justice Romer declined to be drawn into a discussion. He said he would give fair warning that the result of this would be great expense, great delay, and great difficulty in Chambers; and there would be sure to be summonses to vary the Chief Clerk's certificates. If he came to the conclusion that there had been a waste of time and expense, he should throw it on the heads of those who caused it.

Mr. Moulton said if defendants would leave themselves in the hands of Counsel, the plaintiffs would do likewise.

Justice Romer said the defendants knew as well as possible that it was to their interest to settle.

Mr. Moulton said he should propose to arrange with them the royalty which was to be taken as damages.

Justice Romer said if they agreed to that it would be very advantageous; and it would be without prejudice to the defendants' right to appeal. Take judgment by consent, so as to avoid an account of profits; and by consent, in lieu of damages, take an inquiry as to what would be the proper sum for the defendants to pay by way of royalty during the time they had used the infringing retorts.

Mr. Astbury acceded to this so long as it was understood that it was to be a hostile account.

Mr. Moulton agreed that it was not a compromise.

Justice Romer then granted an injunction to restrain the defendants from infringing the plaintiffs' letters patent, but made no order for delivery up or destruction.

Mr. Astbury: In view of the importance of this case to the Salford Corporation, will your Lordship allow a certain stay?

Justice Romer: I will suspend the operation of the injunction for three months. But the inquiry can go on during that time.

Judgment accordingly.

In our report of the proceedings in this case last week, Mr. J. Husband should have been described as the Engineer of the Brentford Gas Company in charge of both the Southall and Brentford works.

COUNTY OF LONDON ASSESSMENT SESSIONS.

Sessions House, Clerkenwell, E.C.—Friday, March 19.

(*Before Mr.* W. R. M'Connell, *Chairman, and a Bench of Magistrates.*)

The Assessment of the South Metropolitan Gas-Works.

As intimated at the close of our report of these proceedings last week, Sir Edward Clarke, as leading Counsel for the Company, to-day summed up the case. After the speech reported below, the Chairman stated that the Court would take time to consider its decision.

Sir Edward Clarke said the task which he had to undertake had become more formidable since hearing the full and clear statement of Mr. Marshall. He proposed to take the simplest form of account of the valuers on his side, and to go through it, endeavouring to establish step by step the accuracy of the figures which he should ask the Court to adopt as the ground of their decision. As to the form of the decision, he asked the Court to state the value of the whole hereditament—the gross rateable value and the net rateable value. The figure on one side stood at £80,000; and on the other, at £173,000 for service mains, after deducting the rateable value of the works and the unproductive mains. He was asking the Court to put the rateable value of the whole undertaking, including works and unproductive mains, at about £157,000; while the figure of the respondents was £228,000. Of course, when the assessment of the whole hereditament had been arrived at, it would have to be apportioned among the various parishes. The larger figure of £892,070 of gross receipts for gas and meter rentals was agreed; and he pointed out that every 1 per cent. dealt with by the Court therefore represented £8900. The figures of the appellants gave a percentage of rateable value to gross receipts of 9·3; those of the respondents, about 19; while the assessment appealed against, taking all the parishes, stood at about 15. Taking the account year as that ending at June, 1895, the first question to be considered was what rent the tenant—who might be taken to be Mr. Livesey, would, in the middle of the year 1895, with his knowledge and experience of the Company's affairs, and with his experienced prevision of what was likely to happen in the succeeding years—would be willing to give from year to year for the undertaking. Mr. Livesey went before the Assessment Committees, and stated, to the best of his belief, his expectation of what was likely to occur; and if this expectation was reasonable—and so far as the facts could be applied, they supported it—it was an important matter for the Court to ascertain. He (Sir E. Clarke) produced a comparative statement of the valuations of Mr. Ryde and Mr. Woodall, in which the receipts from residuals were added to those from the sale of gas. The first figure was gross receipts £1,166,699, which compared with the figure of £1,241,340 in the respondents' valuations—a difference of £75,000. Regarding this difference, the whole question was as to whether the appellants were right in deducting in respect of the reduction of 1d. per 1000 cubic feet in the price of gas; and whether they were right in diminishing the amount produced by residuals by about £45,000, less an addition of 6d. per ton for the lower price of coal. As to the first, it was urged by the respondents that it was not right to make the landlord's rent dependent on something done or not done at the will of the tenant; and that if the tenant chose to reduce the price of gas, he could not thereby lower the rateable value of the hereditament. But it must be assumed that the tenant was doing the best he could for the purpose of his business; and when the result was ascertained, they had the rent which he would be willing to give. On going into the concern, the whole anticipation would be before him; and it would be unreasonable to say that the anticipation of making a larger profit should be considered, but that he should have no credit at all for the diminution of income arising from one branch—reducing the price of gas. In the middle of 1895, the calculation that had to be made was upon the footing of the arrangement existing during the second half of that year; but in this second half, the price of gas was going to be less than in the previous half year or year. He submitted, therefore, that when this change had taken place, it was obviously reasonable to consider it as part of the circumstances when making the estimate. The reduction to be made was calculable. So many thousand cubic feet of gas had been made and sold during the year; and assuming the same consumption to continue the next year, they got £28,916 as the reduction. But against this figure, had to be set the gain in the price of coal, which had sunk, as was expected, by 6d. per ton; and this amounted to £19,600. As to the £28,000, Mr. Marshall (the Counsel) said there was an increase in the volume of business which gave a gross profit to the Company; and this formed, not a reduction, but an increase on the figures of 1894-95. But there was the fallacy involved of taking gross results in this case, because the gross results were produced by different causes, involving different considerations as to repairs, outgoing expenses, &c. With respect to the reduction in price of coal, Mr. Marshall had no quarrel with him, except that the amount allowed (which was in favour of the rating authority) was not large enough. He urged that it should be allowed at the rate of 8¼d. per ton, instead of 6d. In the second half of 1894, the cost of coal was 10s. 9d. per ton; and in the first half of 1895, it was 10s. 11¼d.—the average being 10s. 10½d., which was compared with the 10s. 2d. for the second half of 1895, giving a reduction of 8¼d. This was right arithmetically; but they had to deal with year as compared with year. In the first half of 1896, coal increased in cost again by 2¼d. a ton. Comparing 1894 with 1895, the reduction was only 1d.; and taking the twelve months to June, 1895, and comparing it with the year to June, 1896, the reduction was only 7d., not 8¼d. per ton. Counsel contended that the figures showed that the allowance of £19,000 for a reduction of 6d. per ton of coal was too large, because as between the complete years 1894 and 1895 there was only a reduction of 1d., and between 1895 and 1896 of 2¼d, so that there had not been in any complete year a fall of 6d. Mr. Livesey, however, had the contracts; and taking, as the other side had done the year to June, 1895, as against that to June, 1896, there was a fall of 7d. But he (Sir E. Clarke) would show that they had more than allowed for this in residuals. The point he desired to make was that the evidence of Mr. Livesey giving credit for a reduction of 6d. a ton in coal had proved, taking the whole year through, to have been in excess of the real reduction; and, therefore, the £19,000 allowed in respect of this 6d. was a larger figure than should have been taken. Turning to residuals, he said it had been suggested that there had been some error in the amount of anticipated loss allowed under this head. Mr. Ryde had allowed as reduction on coke and breeze 12 per cent.; and on ammoniacal liquor and sulphate, 30 per cent.—or a total of £45,725. Counsel referred at length to Mr. Livesey's evidence as to what the anticipated reduction would be. He then went on to say that, whereas the residuals realized 9s. 3d. per ton of coal carbonized in 1894, the figure was only 7s. 9¼d. in 1895; and instead of recovering in 1896, the receipts went down still further to 6s. 9¾d. per ton. Taking the reduction between 1894 and 1895 of 1s. 6d. per ton, and assuming that the same number of tons of coals (738,572) were carbonized in 1895 as in 1894, this would give a loss of £55,392, against the estimate of £45,000. He submitted that these figures had been properly taken into account; and if the Court had any doubt on the point, the facts showing the descending scale in the value put it beyond doubt that this diminution ought to be considered before one could arrive at a fair value of the hereditament the rent of which they had to ascertain. On the published accounts, it was perfectly clear that there had been a loss to the extent of 1s. 6d. on account of residuals for each ton of coal carbonized, compared with what would have been obtained if the prices of 1894 had still ruled the market; and not only this, but in the next year there was another fall of 1s., which would give a further diminution of £36,900. He submitted, therefore, that this demonstrated the propriety of allowing, when considering the rent the tenant would have to pay, the reduction in the amount which he would receive for residuals—which the tenant could and did foresee, the extent of which he did not overestimate, and the nature of which he stated to the Assessment Committees. Turning to the schedule of working expenses, the first item to be dealt with was "gas-fitting, labour, £8591." While the appellants claimed that the whole of this should be allowed, the valuers on the other side differed; Mr. Dinwiddy allowing only a half, Mr. Valon a quarter, Mr. Eve a half, and Mr. Hedley the whole. He could not see why the whole of this sum should not be allowed as a working expense of the undertaking. It was said to be a new expense; but what had that to do with it? It was an expense that the tenant had to bear. Whether it came about through change in the conduct of the business, or the provision of certain fresh meters which required labour to be spent on them, if in one year the tenant had expended the amount, and if there was reason to believe that in the following year he would have to lay out as large a sum, there was no reason for disallowing it either in whole or in part. It could not be suggested that it was in any way a capital expenditure. It was expenditure which the tenant would have to bear in one year; and it was fairly in evidence that this £8591 for the year to June, 1895, became a larger item in the following year—viz., £8897. In these circumstances, he failed entirely to understand on what principle the proportions allowed by the various witnesses could be sustained. The next item was the small one of Directors' allowances. Mr. Dinwiddy now only allowed one-half of this item—viz., £1750—but in making up the account as for the year 1894, he allowed the whole sum. He (Sir E. Clarke) could not help thinking that this was one of the alterations which they had seen in the course of the case, and which perhaps were intended to meet some difficulties which the decision of the Court had put in the way of the respondents. The argument in the case of the preceding item largely applied to this one; and he should not discuss it, beyond suggesting that it was a very reasonable sum to be allowed for directing so large and complicated a concern. The next item was important—viz., tenant's repairs and maintenance, of which the appellants allowed one-third of the total. Mr. Ryde allowed £57,477, as one-third of the actual total; while Mr. Dinwiddy allowed £35,000, Mr. Valon £28,738, Mr. Eve £30,000, and Mr. Hedley £19,646. Mr. Dinwiddy had roughly taken one-third of

£118,000; while Mr. Valon's £28,738 was one-sixth of £172,428. The first point in connection with this was the total which, when ascertained, had to be divided between the landlord and tenant? Mr. Ryde took the actual expenditure for repairs and maintenance—£172,428. Mr. Dinwiddy, however, contended that they should take the average of five years, apply this figure of average, and so arrive at a calculated figure, instead of the actual figure for the year. Counsel referred to the case of the London and North-Western Railway Company against the Wigan Guardians, in which it was decided to take the actual figures of the account year; and he asked the Court to apply the same principle to the present case. One of the facts urged as a reason why the rateable value of the Company was likely to increase, was that wages were getting less—that apart from the question of whether each particular man received a larger sum or not, the proportion of wages to coal consumed was growing less. This was true; but why? Because the tenant had substituted for manual labour a great deal of machinery. The tenant had to deal with the repairs of the undertaking, which was changing its character, and with respect to which there was a much larger amount expended in machinery, which required repair, than in the item of wages. If this change were going on from year to year, as it had been, it would be most unfair to go back and calculate on the basis of previous years. Counsel, therefore, having regard particularly to the specific admission of Mr. Valon, that his £28,738 was a sixth of something (which "something" must be £172,428), thought that he was entitled to use the actual figures for tenant's repairs and maintenance —viz., £172,428. Then came the question as to what fraction was to be taken as the tenant's allowance; and here he could not help quoting Mr. Dinwiddy, who, taking a smaller figure as the total, allowed one third. Counsel should, therefore, ask the Court to say that this proportion should be taken of the £172,428, and allow the £57,477. This figure, too, was practically supported by Mr. Woodall, who, by a different method of calculation—namely, by estimating the repairs at 1s. 6d. per ton of coal carbonized—arrived at the figure of £56,809. Turning to tenant's capital, there were several items—Directors' fees, gas-fittings (labour), tenant's repairs of plant, works, &c.—which were the same figures as he had just dealt with, and to which the same considerations applied. Rates and taxes were an item that depended upon the decision of the Court. Mr. Ryde put them at £42,635 for the year; allowing five-twelfths as the sum upon which the percentage would be claimed. Mr. Woodall put the figure at £23,763 for the half year. Whether it was right to allow the tenant five months' proportion of the working expenses, was a matter of difference between the witnesses. The appellants' witnesses said five months was the proportion they were in the habit of allowing, and which it was reasonable to allow; while the opposing valuers said four-and-a-half months was as much as was necessary—one stating that four months was sufficient. Without referring in detail to the evidence on this point, he would remind the Court that the appellants had taken five average months, which would represent something less than four months of the heaviest period of the year. Mr. Dinwiddy, Mr. Valon, and Mr. Eve all allowed four-and-a-half months in respect of coal; but some question arose as to the amount of credit to be given in regard to residuals. The appellants held that, while entitled to have five months' working expenses, they should only have four months' counted against them in respect of residuals, because they had to give some credit for them. The money for residuals was not paid immediately; but for coal, as had been seen from the contract, they paid within a week of shipping—in some cases before it was delivered. In the accounts, there appeared certain balances due by the Company at the end of 1894 and at June, 1895, which it had been suggested included coal, and showed that the Company were owing something on account of coal. The explanation was that, if the accounts had been made up to a Wednesday, there would not have been a shilling owing for coal, as each Wednesday cheques were made out under contract. But the last day of one of these half years was a Monday, and of the other a Sunday; and it so happened that in each case the coal contracts had not been dealt with, and so there was an outstanding debit. Substantially, however, they paid prompt for cash. But the income for residuals was not received for some time. Mr. Dinwiddy gave a fortnight on this score; but the other witnesses for the respondents allowed no time, assuming that the moment they began with the coal a clear amount would come in from the sale of residuals—an assumption which must be unreasonable. Counsel strongly suggested that five months' allowance was not excessive. Reverting to the item of £8591 for gas-fittings (labour), his learned friend Mr. Marshall suggested that, having been charged in the working expenses, they ought not to be included in the tenant's capital. He (Sir E. Clarke) had not been able to follow this argument. All the items of wages, salaries, repairs, meters, stoves, and so on, had been charged and found a proper place in working expenses for which the tenant must prepare himself, and for which he must have the capital ready; and if properly included as working expenses which the tenant would have to meet, it seemed that they were properly included in the calculation of working expenses upon which the estimate of capital he required was based. Therefore he submitted that the £8571 was properly included in the working expenses, and rightly considered as an item for which he would have to pay some capital—especially as it was a continuous, and not an occasional outgoing. Coming to the table of meters, stoves, and fittings prepared by Mr. Marshall (the Counsel), he (Sir E. Clarke) said it was very useful for examining where the difference was between the two sides upon this item, which was extremely important as affecting the decision of the case. The table gave the figures of Mr. Ryde and Mr. Marshall, and certain other figures representing the respondents' contention. The first figure in difference was £16,000 for taps for wet, dry, and automatic meters and for stoves, allowed by appellants but not by respondents, except as to £2000 odd for padlocks which was included in the item. Counsel, however, could see little difference between the padlocks and taps. When a supply of gas was cut off for any reason, the meter, padlock (if there was one), and tap were taken away. The Company were bound to remove the tap, otherwise the consumer would be able to steal the gas. The Company could use the tap for any other pipe; and he submitted therefore that there was no possible reason for suggesting that it was not part of the tenant's capital. The item should certainly be allowed. The next item was gas-fires; and under this head, of £10,973 claimed only £2000 was allowed. The respondents' valuers who gave this £2000, said it was purely an estimate; but Counsel failed to understand why this round figure should be selected. These gas-fires actually cost £10,973, and surely the right thing to do was to include this sum in the figure of cost of meters, stoves, and gas-fires, and then apply the proper sum for depreciation. With regard to the item of automatic gas-fittings, £51,732, Mr. Ryde claimed £41,391, which was the £51,732 less 20 per cent. for depreciation. There had been a discussion as to the receipts for gas supplied through the automatic meters, which was charged for at a higher rate than gas supplied in the ordinary way; the difference, or part of it, being carried to a suspense account, which now amounted to £26,000. This was one of the most difficult questions they had had to deal with in the case. There was no doubt that the automatic meters were there, and that they had been put there so recently that the 20 per cent. allowance for depreciation was more than adequate; and, therefore, that there was £41,391 worth of property that the tenant would have to buy. On the other hand, the person putting them in undoubtedly had a sinking fund or suspense account of £26,000; and how this was to be dealt with as between an outgoing and incoming tenant, it was not easy to say. On the face of it, the incoming tenant would have to buy the whole of the meters. Then would he have the sinking fund? It was not easy to say that he would get it for nothing, because he would be coming in and taking the things at their present value; and Counsel was not at all sure that any deduction ought to be made. But he thought there was substance in Mr. Eve's contention that, if this was allowed in tenant's capital, and a percentage given the tenant in respect of it, there should, on the other hand, be deducted a percentage on the money which had come into the concern by way of suspense account. Therefore, while charging the £41,391 for automatic gas-fittings, the appellants gave credit below for automatic meter receipts £16,286. Then arose the most important question of the amount of depreciation to be allowed. Mr. Livesey said it was the habit of the Company to repair, at the cost of current expenses, all the stoves in use; and that this work was so constantly and thoroughly done that only about 2 per cent. of the meters were converted in the course of the year. The question between the two sides was as to whether 33 or 20 per cent. for depreciation should be taken. Mr. Valon, in his table of capital expended from December, 1889, to December, 1894, showed that whereas the expenditure on new buildings and new and additional plant—which would be landlord's expenditure—in the last two years of that period had not been very large, in 1893 the expenditure for tenant's capital had been £27,778 for new meters and £17,938 for new stoves, and in 1894 it had been no less than £38,656 for meters and £29,870 for stoves. So that, coupled with the fact that the renewals and repairs had kept the stock in good condition, they had it proved that there was an exceptionally large number of meters and stoves brought new into the business during the last few years. From the tables of Mr. Marshall (the witness), who said meters required practically no repair till they had been in use for seven years, it appeared that the cost of new meters added in the seven years from 1888 to 1895 was £108,279, which was nearly 50 per cent. of the prime cost of all the meters of the Company (£234,155); and of this £108,279, no less than £66,000 was spent in 1893 and 1894. On these figures, Counsel contended that it was absurd to suggest that meters so recently bought were to be subject to the depreciation allowance of 33⅓ per cent. With regard to stoves, which Mr. Marshall said required practically no repair till they had been in use over five years, the figures were nearly as remarkable. Of the £162,000 representing the total value of the Company's stoves, no less than £105,000 had been spent in the last five years; and of this sum, £47,500 was spent in 1893 and 1894. Counsel submitted that these figures demonstrated that the meters and stoves now belonging to the Company were to a very large extent new; and that the others had been so efficiently repaired, that the 20 per cent. of Mr. Ryde and the smaller figure of Mr. Marshall was ample allowance for depreciation.

The CHAIRMAN: There is no distinction in the table between the life of a meter and the life of a stove, though one is longer than the other?

Sir E. CLARKE: We make none; we have allowed a depreciation of 20 per cent. Continuing, he pointed out that the respondents claimed to deduct 30 per cent. for depreciation on automatic meters, though they had all been new since 1892; and also on meters and stoves, though about 45 per cent. of the former and 60 per cent. of the latter were new within a period which might be taken as the life of a meter or stove respectively. He submitted that 20 per cent. deduction was ample. As to the percentage to be allowed on tenant's capital, he complained that the respondents' witnesses, who had been proposing to contend that 15 per cent. instead of the usual 17½ per cent. should be allowed, on hearing the intimation from the Chairman that the Court did not intend to depart from the 17½ per cent., made various alterations in their valuations. In the case of Mr. Dinwiddy, these alterations were such that, whereas his 15 per cent. had brought out £73,500, after the Court had adhered to the 17½ per cent., the figure was reduced to £73,000. If there was anything that would show the Court the importance of standing by the 17½ per cent. all round—or whatever percentage might be chosen—it would be the comparative statement of the respondents. Counsel read a number of items from this statement, with the percentages which the respective valuers applied to them; there being great divergencies of opinion as to what the percentages should be. He contended that it was most important, in the interests of public time and of litigants, that there should be some rule as to the percentage to apply to the whole of the tenant's capital when once this capital was ascertained. The amount of complication that would be added to the already sufficiently difficult nature of the matters dealt with in these cases, if every surveyor were to put a different percentage upon each item of tenant's capital, would be very serious for those engaged. It was not possible for him to understand the principle upon which one thing was put at one percentage, and one at another. He asked the Court, in the public interest, and having regard to the complexity already besetting these cases, to arrive at an amount of money which they considered the tenant would require for capital on going into the business, and then to allow 17½ per cent. on it. Turning to statutable deductions, Counsel said these were merely the applications of figures the Court had had before. Mr. Ryde took repairs of works, machines, retorts, mains, and so on, as per the Company's accounts, at £172,430. Mr. Woodall calculated the repairs at 5½d. per 1000 cubic feet—a figure which his experience supported—and thus arrived at £170,428, or substantially the same sum as Mr. Ryde. So

that the general experience of Mr. Woodall indicated as a reasonable sum, the amount which was actually spent. On these figures, he (the learned Counsel) urged that one-third should be allowed in working expenses to the tenant—£57,477. The other items in the account—insurance and renewal of gasholders—he should pass, as Mr. Dinwiddy accepted them. With regard to Mr. Marshall's valuation, he said that as his figures were arranged on a different basis, they could not be included in the comparative statement. They, however, resulted in a rateable value of £88,500, or something under 10 per cent. on the total gross receipts from gas and meter rentals. Though prepared differently, his figures substantially supported those of Mr. Ryde and Mr. Woodall; and great importance was to be attached to his valuation, because he was a most experienced valuer, and also because he had acted for some of the parishes with which the Company had settled in the case of the present assessment, and so had had the advantage of looking upon this matter from both sides. Mr. Marshall started his valuation without regard to the reduction in the price of gas, residuals, or coal—simply taking the amount appropriated by the Company in 1894-95 under their statutory powers, less £11,690 carried to reserve fund.

Mr. MARSHALL remarked that the available amount divisible between the landlord and tenant would, in the case of Mr. Marshall (the witness) as in that of the other valuers, be increased in consequence of the intended reduction in the price of gas; and this ought to be considered in his case as much as in that of the other valuers.

Sir E. CLARKE said he should make no demur to that, if all the matters were to be considered on one side or the other; but Mr. Marshall was not taking them at all. He did not diminish the income in respect of the reduction of 1d. per 1000 cubic feet in the price of gas, nor increase it in respect of the 6d. fall in the cost of coal. Continuing, he said in the case of the Company, they had a tenant who had only a limited power of dealing with his profits; but Mr. Marshall (the Counsel) asserted that at some time or other the profits, if made, would leak into the tenant's pocket. They might over a series of years tend to equalize the dividend; but the tenant, for the year he was going to pay rent, could not put into his pocket a larger sum than he was allowed by the terms of the tenancy. The learned Counsel then called attention to the various points in Mr. Marshall's evidence; and went on to refer to the statement that had been made—that the year 1890, when the previous rating of the Company was settled, was a particularly bad one, and that therefore the rating was low. The strike expenses, it was true, amounted to £62,000; but, he pointed out, all this expense was excluded from consideration when the assessment was dealt with in 1890. Mr. Livesey's evidence was quite clear on this point. The rating by agreement was then fixed at about 10 per cent. all round. In the present proceedings, also, after the case had started, he (the learned Counsel) made an offer to settle; but it was not accepted. Some of the parishes, however, before coming into Court, were settled with at an average of 40 per cent. increase. For the purposes of this valuation, the Company were in a very difficult position. They had succeeded in coming to terms with the large central parishes, in which the most important and most costly portion of the undertaking was situated. Then, if other parishes stood out, and on a threat of coming to Court the Company gave a higher figure than they had given to the others, it might be said that they were not dealing fairly. The Company therefore had put before the Court certain figures, which they thought were reasonable; and he asked the Court to say, on consideration of these figures, and the evidence of Mr. Ryde, Mr. Woodall, and Mr. Marshall, that no better proof was ever given of a desire to act reasonably, and to avoid the enormous expense of the present proceedings, than was given when he made his offer to the respondents on behalf of the Company at an early stage of the case. The present assessment was extravagant; and he claimed that the Company were entitled to the reduction indicated by his witnesses. There was one point he would like to clear up, and that was the suggestion that the Company's figures were inadmissible because the tenant was to receive £118,000, or 17½ per cent. on his capital, while the landlord got a very small percentage. But he went through a short calculation, showing that the landlord would receive 6 per cent. on his capital, which, in a concern of this kind, was certainly not inadequate. The tenant, of course, must get the larger return, because he was taking all the risk. In conclusion, he said he had endeavoured to deal with all the questions that had been brought before the Court.

As already intimated, judgment in the case was reserved.

The Crystal Palace District Gas Company's Appeal.—The Chairman of the Crystal Palace District Gas Company (Mr. G. Livesey) has sent a letter to the Beckenham Urban District Council, suggesting that the papers in connection with the appeal which is being made by the Company in respect of the fine imposed by the Bromley Magistrates for deficiency of illuminating power (see *ante*, p. 241) shall be placed in the hands of Mr. A. G. Vernon Harcourt, one of the Metropolitan Gas Referees, and the matter discussed between him, the Chairman of the Company, and the Chairman of the Council. The Council will not, however, entertain the proposal; so the appeal will take its ordinary course.

Adelaide Water-Works.—The following description of the new Happy Valley Water-Works, which supply Adelaide and its suburbs, is extracted from the report of the Commissioner of Public Works of Adelaide to the Governor: The Happy Valley works consist of a weir across the River Onkaparinga, at Clarendon, and a storage reservoir at Happy Valley capable of holding 3000 million gallons. The weir is constructed of rubble concrete, and faced with marble. It is 268 feet in length and 38 feet in depth, the width at the top being 9 ft. 6 in. The water is taken to the reservoir at Happy Valley by means of a tunnel driven straight through the hills, a distance of 3 miles 260 yards. It is 7 ft. 9 in. wide, and 7 ft. 2 in. high, and has a carrying capacity of 100 million gallons per diem. The water at Happy Valley will cover an area of 440 acres, and when full the reservoir will have a depth of 65 feet. The embankment is 72 feet in height, the width at the bottom being 380 feet, and at the top 20 feet. A puddle core of clay thoroughly worked has been put through the whole length of the embankment to a depth of 38 feet below the surface, thus making it perfectly water-tight. A contour drain has been constructed to prevent flood waters entering the reservoir, and thus avoid all chance of pollution. The outlet tunnel is about 1½ miles in length, and is lined throughout with concrete.

MISCELLANEOUS NEWS.

PRESENTATION TO MR. ROBERT MITCHELL.

Last Thursday afternoon, the officials and workmen who have served under Mr. Robert Mitchell at the Edinburgh Corporation Gas-Works made a presentation to him and Mrs. Mitchell, as a mark of esteem and respect for him on his retiring from the post of Engineer and Manager of the works. The ceremony took place on an extemporized platform in front of the governor-house. There were present Mr. S. Stewart, of Greenock, and Mrs. Stewart; Mr. A. Masterton, Assistant-Manager at the Edinburgh works, Mr. J. Somers, of the meter department, Mr. Porteous, of the distribution department, and some two or three hundred workmen. The gifts were in the form of a handsome silver bowl, of the "Armada" pattern, beautifully ornamented, for Mr. Mitchell, and a silver coffee-tray, also richly ornamented, for Mrs. Mitchell. On the bowl there was the following inscription: "Presented to Robert Mitchell, Esq., on the occasion of his retiring from the position of Engineer and Manager at the Edinburgh Works of the Edinburgh and Leith Corporations Gas Commissioners, by the Officials and Employees, as a token of their respect and esteem. Edinburgh, March 25th, 1897."

Mr. DUNCAN ALEXANDER, the General Foreman at the works, who is the oldest employee in the service of the Commissioners, made the presentation. In doing so, he said: It is at all times a pleasing task to do honour to those we esteem; but the pleasure manifestly increases when we find that this esteem is shared by so large a body as those who form the subscribers in the present case. But in proportion as the pleasure increases, so does the diffidence one feels when called on, as I am, to be the exponent of the feelings of the subscribers. Now, gentlemen, there may be, and doubtless are, many who, by their abilities, are far more competent than myself to discharge the duty I have undertaken, but there is no man living to whom I will yield one grain of the estimation I hold for our friends, Mr. Mitchell, the Engineer and Manager of the Edinburgh Gas-Works, and his good lady, Mrs. Mitchell. I will not dilate on the many good services rendered by our Manager, or the upright and manly conduct that has characterized his course in life—winning for him, as it has done, the esteem of all. As a friend, as a man, as a gas engineer, he has gained golden opinions and that fair fame that ever crowns the worker of good deeds. Were he not present, much more might be said and endorsed by every one here. As it is, we must be content. And now, Mr. Mitchell, the happy task is mine to present you, in the name of myself and the subscribers, with this. May your life be long to look on it as a feeble token of the high estimation formed of you by so many of your fellow-men, and when it will please the great Architect of the Universe to remove you from this life, may this descend as an heirloom to your children, and stimulate them to a course that won for their ancestor the praise and respect of his fellow-men.

Mr. MITCHELL, in acknowledging the presentation, said it gave him very great pleasure, in one sense, to be there that afternoon, but not in the sense, as he had often heard it expressed, that it was the happiest moment of his life, because he looked upon the very many kind faces before him with a certain feeling of regret. He hoped they would all work harmoniously and kindly with his successor, as they had done with him. When he entered the Edinburgh works, more than sixteen years ago, they were making 574 million cubic feet of gas per annum; whereas last year they sent out of that little dirty corner—he could not call it anything else—1037 millions. When he went there, they were running through 64,000 tons of coal per annum; last year they ran through 102,000 tons. All this had been done on ground which the Edinburgh Gas Company considered to be far too small for their business. In his opinion, the Company were right. However, the Corporation thought differently, and they had acted differently. When he went there, the price of gas was 4s. 2d. per 1000 cubic feet, and of the quality of 25·53 candles. It was now being sold at 3s. per 1000 cubic feet, and of the quality of 25·66 candles. He could not have brought this about without the hearty co-operation of the workmen. Since he came there, there had been an expenditure of nearly £69,000 upon mains. He thanked them most heartily for the very handsome gifts they had presented to himself and Mrs. Mitchell. He was sure they would all believe him when he said that both he and his wife cordially reciprocated their good wishes.

The Presentation Committee and a few friends then adjourned to one of the draughtsmen's rooms, where light refreshments were served.

Mr. MASTERTON proposed the health of Mr. and Mrs. Mitchell. He said that for sixteen years Mr. Mitchell had been Manager of the works, and during this time he had done much good and useful work in remodelling, extending, and improving the machinery, buildings, and apparatus, as also in altering and enlarging the distributing plant. He understood that the total expenditure upon all the various schemes Mr. Mitchell had carried out amounted to upwards of £200,000. With reference to the relationship which existed between Mr. Mitchell and his working staff, they would all agree with him that it was a very harmonious and satisfactory one. Mr Mitchell always took the common-sense view of the various questions—often complex and difficult to solve—which came under his notice from time to time. He treated the men fairly; and he was likewise always just, and very often generous. Mr. Mitchell must not think that they would forget him, or cease to take an interest in his or his family's welfare. He was still to be a citizen of their town; and he (Mr. Masterton) knew his earnest desire was that the future might hold continued success and prosperity for the old Edinburgh Gas-Works.

Mr. S. STEWART said he had been acquainted with Mr. Mitchell for a great many years, and had known all the trouble and difficulty he had had in connection with the works. Carrying on gas making in such a place must have been a matter of great anxiety, not only to Mr. Mitchell, but to his whole staff. He could therefore quite understand how, with all the anxieties Mr. Mitchell had had, his health had broken down. He (Mr. Stewart) was not surprised at it; for he had all along seen that the works were such as could only be carried on with great difficulty.

Mr. MITCHELL returned thanks in a single sentence, and proposed the health of Mr. D. Alexander, as representing the officials in the works.

Mr. ALEXANDER, in response, said he was commencing his 45th year of service in the Edinburgh Gas-Works. He entered them as smith when

he was 22 years of age; shortly after that he was appointed foreman in the retort-house; and about 38 years ago he was promoted to be general foreman. He had seen the works turned up three or four times; and all the pipes taken out of the ground and replaced by new ones. He had been with four Managers—Mr. Watson, Mr. Watson, jun., Mr. Henderson, and Mr. Mitchell. Mr. Herring would be the fifth. During all his time they never had been able to get the works ahead of the consumption of gas. If they did get something done one summer, by the following year matters seemed to be as bad as ever; and this was apparently the case still.

THE STIRLING GAS-WORKS ARBITRATION.

Edinburgh—Monday, March 8.

(*Before Sheriff* LEES.)

At the conclusion of the case for the Stirling Gas Company—as reported in the "JOURNAL" last week, p. 673—the following evidence was given on behalf of the Corporation:—

Mr. *R. Cockburn Millar*, C.A., of Edinburgh, said he had examined the books of the Company for the six years ending May 15, 1896. The capital account had not been written up since May, 1886. At that date the capital, according to the books, was £14,900. He had been informed that it was now £29,772. In the books, there was no separate record of capital expenditure after May 15, 1853; but he knew, from the books, that certain sums which had been expended for extensions were entered against revenue. He had prepared a statement which showed the book value of the works, the gas made, and the capital per million cubic feet of gas made, in Airdrie, Cambuslang, Coatbridge, Galashiels, Hawick, Kirkcaldy, and Uddingston. He selected these as the non-statutory Companies whose accounts he had access to. The lowest of them was Airdrie, where the capital was £404 per million cubic feet of gas made. In Galashiels, the figure was £444; and Cambuslang was the highest, where it was £725. "Field's Analysis" showed the capital per million cubic feet of gas sold to be as follows: Metropolitan Companies, £755; Suburban Companies, £616; Provincial Corporations, £566; and Provincial Companies, £521. The quantity of gas made in Stirling showed considerable fluctuation. The books did not give the amount of leakage; and as to this, he had nothing to say. The number of consumers in 1891 was 3894, as shown by separate meters registering; and in 1896, the number was 3816. These figures were exclusive of 32 contract consumers in 1891, and 34 in 1896. There was also a book which showed consumers by numbers; and from this, he found that in 1891 there were 4590, and in 1896 4462 consumers. Accordingly, it would not be fair to represent the business as a steadily increasing one, though, in the long run, there might be a greater quantity of gas made. He had prepared a table according to which the maximum day's make seemed to have been in 1890 325,000 cubic feet, and in 1896 400,000 cubic feet; and the maximum day's consumption appeared to have risen, with fluctuations, from 326,000 cubic feet in 1889 to 394,000 cubic feet in 1896. It fell in 1893 to 324,000 cubic feet. He had not seen any proper meter-register; nor any register of the numbers or sizes of meters. The books showed nothing charged against bad debts, except one item for residuals, in 1891-92; and no provision was made for this debt, which resulted in a loss of £30 14s. 10d. He had only dealt with the last five years; omitting the preceding two years which Mr. Robertson had dealt with, because it was only at May 15, 1891, that he found any record of the stocks on hand. He thus avoided hypothesis, and founded himself on fact. The stock of coal on hand in 1891 was of the value of £870; and in 1896, £171. The residuals sold in 1891 amounted to £267; and in 1896, to £212. There was thus a difference, on stocks alone, of £754. This indicated the kind of difficulty to which accounts were exposed, which began without ascertaining the stocks on hand, and ended with the assumption that the stocks were the same at the end as at the beginning. On other accounts, he found a sum due in 1891 of £281; and in 1896, of £382. This explained another £100 of difference between his accounts and those of Mr. Robertson. Then Mr. Robertson had taken the honorarium of £75, which was paid to the Treasurer in 1894-95, out of revenue; but witness considered that it should remain as against revenue, because the Treasurer had only £25 a year, and the £75 spread over five years brought his salary up to £40, which did not seem to him to be an extremely heavy thing for the Company, when the other salaries paid were taken into account. He had also disallowed a sum of £22 interest received on deposits from consumers. Further than this, he had left in the wages account the sums which Mr. Robertson had taken out as being applicable to new plant and machinery, and also new meters. The books, in his opinion, contained nothing to warrant the taking of these sums out of revenue. Mr. Robertson also, in the five years, charged £247 to capital in respect of new meters. He saw no increase in the number of consumers to warrant this transference. For the seven years, Mr. Robertson allowed £266 for repair and maintenance of meters. This was an average of £38 a year, which worked out at 0·18d. per 1000 cubic feet of gas sold. Assuming that the value of the meters was £4430, and allowing nothing for repairing and re-fixing, the life of a meter would be assumed to be 116 years. In Mr. Robertson's statements, there was included, under wages at works, the salary of an inspector of meters, amounting to £88 a year; and this should have been under distribution. This made a very material difference, when they entered into the question of how much of the wages ought to be put to repairs and maintenance, and how much to carbonizing and purifying. The wages at the works, taking off those of the collector and the lamplighters, came to an average of £722, for the seven years, which was equal to 3·3d. per 1000 cubic feet of gas sold. In "Field's Analysis," the wages for carbonizing alone were: Metropolitan Companies, 3·95d. per 1000 cubic feet of gas sold; Suburban Companies, 3·90d.; Provincial Corporations, 3·36d.; Provincial Companies, 3·94d.; Glasgow, 4·59d.; and Dublin, 5·06d. These were all higher than Mr. Robertson's figure. In Falkirk, the wages for carbonizing, during the six years ending 1894, amounted to 4·78d. per 1000 cubic feet of gas sold. In Dunfermline, during the six years ending 1896, the wages for carbonizing came to 4·26d. per 1000 cubic feet of gas sold; and last year, they came to 3·85d. In Dunfermline, the wages for storing coal, and in the purifying and residuals departments, were 1·22d. per 1000 cubic feet of gas sold, which, added to the 3·85d., made the total wages 5·07d. In the matter of the storing of coal, he knew nothing at Stirling which would give it an advantage over Dunfermline. Mr. Robertson's deductions were based on estimates; and he did not see his way to follow them. The fluctuating element of the stocks vitiated any statistics Mr. Robertson had prepared. The price of coal in 1892 was 19s. 11d. per ton; in 1893, 16s. 1d.; in 1894, 14s. 10d.; in 1895, 11s. 4d.; and in 1896, 11s. 7d.—the price in the last two years being for coal and oil together, calculating 75 gallons of oil as equal to one ton of coal, and 254 gallons of oil as equal to one ton of oil. In recent sales of Stirling gas shares, the prices ranged from £7 1s. to £8 5s. The yield was about £4 15s. per cent. Expressed in years' purchase, this was equal to 21½, after allowing for accrued dividend.

Cross-examined by Mr. CHRYSTAL: The stocks were entered in the carbonizing-book in pencil. He thought the structural value of the works was an element which ought, most assuredly, to be taken into consideration as clearly as any other element in the case. The business of the Company was increasing; but it was another matter to say that it was prosperous. The profits certainly did not indicate increasing prosperity. The make of gas per ton had been less during the last two years. The cost of coal had come down; but the price of gas had not.

Mr. *James M'Gilchrist*, Gas Engineer at Dumbarton, said he had been connected with a number of gas transfers, in some of which he had acted as Umpire, and in others he was sole Valuator. In some instances, he was employed jointly by both parties; in others, he was employed by one of the parties only, but his valuation was accepted by both. He had never had a fighting valuation. He was asked by the Stirling Police Commissioners to make a fair valuation of the gas undertaking. He made a valuation which was intended to form the basis for negotiation; it was not in any way meant to facilitate the making of a low offer at first, with a view to coming to a larger one. The Company placed in his hands certain reports upon their accounts, which they had received from accountants. He also had given to him a report by Mr. Gillespie, as to the condition of the works. He examined the whole plant; and he presented a report, dated Nov. 12, 1896, in which the valuation was £61,130. The only material point of difference between the conditions in this report and those on which they were now proceeding, was as to the payment of the conveyancing expenses. He was asked by the Company not to make any use of the information he obtained in going over their works which would be detrimental to them; and in subsequent proceedings before the Commissioners, he did everything in his power to keep his counsel. He was still of opinion that £61,130 was the full value of the undertaking. He discussed the report with the Commissioners; and he made oral explanations to them. They asked for a fuller report; and he sent one to them, dated Nov. 23. In this report, he went into the matter in greater detail. It was after this that Mr. Gillespie's report was presented. There was also a sort of supplementary report, which he handed in a little later, after Mr. Gillespie had given his valuation. In his report, he said that the works and plant, generally speaking, were in fair condition. The retorts were not up to present ideas; the scrubber and the washer were below the requirements; and the purifiers were not arranged in proper order. Supposing his valuation to be accepted, 10 per cent. upon it—about £6000—would more than make good all the defects he had referred to. Generally, he did not disagree with the criticisms which had been made upon the condition of the undertaking by Mr. Gillespie. There did not, unfortunately, appear to be much margin in the works. Neither the Company nor the Corporation could proceed to supply gas next winter without adding considerably to the plant. Every retort, he was informed, was in use last December. The scrubber was a third or a fourth of the capacity of the purifiers, and was too small. The gasholder capacity was short (by about 80,000 cubic feet) of the recognized standard for storage accommodation. It was quite true the works could be made to rub along without a margin of this kind. If the Railway Company were to take the piece of ground which they claimed, it would materially affect the storage accommodation. It would be necessary to make a new siding and coal-store, which would entail considerable expense. The scrubber had more work thrown upon it because of the condition of the purifiers. This was more likely to be serious in a Scotch company—and particularly in Stirling, where they used shale. Shale more rapidly exhausted the lime in the purifiers. When before the Committee of the Corporation, he pointed out that during the past six years an average of £1055 per annum had been paid out of revenue account, which partly belonged to maintenance of works, and partly to capital expenditure. He thought that 3s. 4d. per 1000 cubic feet was a fair price for the gas; but perhaps it might be arranged a little lower. He took 4¾d. per 1000 cubic feet of gas sold as the figure for the repair, maintenance, and renewal of works. The figure adopted was very often 5d.; but in Scotland experience pointed to its being a little less than this. The condition of the works in Stirling made more labour necessary, and placed the Company at a disadvantage in the matter of wages, as compared with the places named. Taking this into account, he might be justified in making the total deduction 5d. per 1000 cubic feet. In the last year of Mr. Robertson's statements, he put £160 against capital under the heading of wages applicable to new plant and machinery. The capital expenditure in that year was for a new vertical boiler, which might cost about £10 in wages, and the main to Torbrex—a 2-inch main of about 1000 yards—which, at 9d. per yard, should have cost £47 10s. But he was told that the town paid for the excavating and filling of the track; and the Company's wages bill for the laying of the pipes would not amount to more than about £5. It was not possible to account for the £160 which Mr. Robertson had introduced into the account. He inclined to the view that Mr. Robertson's deductions were over-estimated. Stirling was a place where gas was not much used for heating or motive power. It was just the kind of town where differences in weather would tell on the demand for gas; and, as compared with other places, would make Stirling more subject to fluctuation. He thought that the increase this year was probably due to the weather, for it was a subject of general remark that last autumn was exceptionally dark. He assumed that the maintainable profit was 7s. 4d. per £4 share; and he found that this sum was equal to about 11d. per 1000 cubic feet of gas manufactured. He also considered that this was not

an excessive profit for any gas undertaking. When he came to the question of price, he took 7443 shares, at 7s. 4d. each, which gave £2729 of dividend paid. He further allowed 2d. for income-tax, which the Company paid. He gave 22½ years' purchase of the dividend, which brought out £61,402 10s., or about £270 more than the amount of his valuation. He thought the deduction was made because of the means of checking the valuation which he adopted. This check was based on calculations on the price to be paid for an undertaking per million cubic feet of gas made. The average annual manufacture in Stirling during the last five years was 60,228,680 cubic feet. He took a measure of £1000 per million cubic feet, which would make it £60,228; and they would require to add to this the value of the lamp-posts, at 32s. each, which would raise the sum to £60,856 16s. This figure did not come up to the calculation he formerly made, on the assumed maintainable profit based on the dividend; and so he had taken the mean between them. Estimating the maintainable profit in the way he did, it would not be safe to accept the result obtained by the 22½ multiplier without some such check as he applied to it. In every case where he had been the sole Arbitrator, he had attempted to check any figure of maintainable profit by a rule per million cubic feet manufactured. They often saw great difficulty in fixing the annual maintainable profit; and he therefore thought it was necessary that some other test should be adopted. He took £1000 per million cubic feet as his test. The way in which awards worked out, in regard to this, was various. In the case of Falkirk, it came to £800 per million cubic feet; in Edinburgh, to £886; in Dunfermline, to £1410; in Wishaw, to about £1080; and in Glasgow, to as little as £547. In Falkirk, there was a surplus power in the works; and the rate of increase in the consumption of gas had been about 5 per cent. compound. In Dunfermline, there was also a very large excess of productive capacity. Having regard to all these things, he thought the test of £1000 per million cubic feet was fair. He had also tested his valuation by a percentage upon the share capital; and it came to £2 11s. for every £1 of share capital. In Dunfermline, the rate was £1 9s. 11½d.; and in Falkirk, £1 10s. 10d. In this case the shareholders could easily get a better security for their money in a concern giving a higher return—say, in The Gaslight and Coke Company. Though the valuation should be fixed at a little more than he had named, it would still be a cheap one; and he had advised the Corporation so.

Cross-examined by Mr. CHRYSTAL: His view had all along been that the price should be £61,130. He never arrived at the figure of £64,750. He thought the Company were not unreasonable, seeing they had an expert to advise them, in asking the Sheriff to determine the value of the undertaking; and the Corporation having asked his opinion on the subject of Mr. Gillespie's valuation, he had no hesitation in recommending them to go before the Sheriff. But though he said the works would be a good bargain for the Corporation at £64,000 odd, he never altered his opinion as to the value of the undertaking. He only thought that the Commissioners were in a position to pay a little more, perhaps, than the fair value. He believed that at £64,750 the transfer would be, per 1000 cubic feet of gas, one of the cheapest in Scotland. He would suggest, as a reason why, if £64,750 was the basis of one of the cheapest transfers, the Company should take less, that probably the concern had not been conducted with the same skill as other undertakings, and the property was in need of repair. He believed the distributing-mains were in very good condition. The services were composed of lead; but this, he thought, did not reduce the cost of maintenance, because lead services were very apt to be damaged by blows from workmen's picks. This, however, was not a serious defect.

Mr. *G. R. Hislop*, Gas Engineer to the Corporation of Paisley, said he had acted as sole Arbitrator in transfers; and he had also made a large number of valuations with a view to adjustments of capital and the like. He had carefully examined the works and site at Stirling; and he had arrived at a structural valuation, which he put at £30,019. On the footing of the works being new, the structural valuation would be £42,159. The difference of £12,140, he took to be the actual dilapidation by waste. It struck him at once that, in Mr. Robertson's statements, there must be a considerable discrepancy in the matter of wages in the manufacturing department. The wages were too small. Even with the lamplighters' wages added, the amount was inadequate. In such a works as Stirling, the wages applicable to carbonizing, stowing, and purifying should amount to 4½d. per 1000 cubic feet of gas sold. This would take off £174 from Mr. Robertson's figure of profit. He would also deduct the £88 which Mr. Robertson had included—the salary of the inspector of meters and collector—which left £2601 15s. 6d. Taking this sum at 22½ years' purchase, the value of the undertaking should work out at £58,539 18s. 9d. If Mr. Millar's figures as to the stocks were to be allowed, the amount would be still further reduced. The 4½d. per 1000 cubic feet was a figure that was in accordance with his own experience; and besides this, he had checked it with "Field's Analysis," and with other towns. In Paisley, in 1895-96, the sale of gas amounted to 274,396,000 cubic feet; the wages of men in the works were £4987 18s. 6d.; wages for storing coal, £333; for purifying, £315 14s. 7d.; and in the residuals department, £303 5s. 5d.—a total of £5939 19s. 11d., which gave 5s. 2d. per 1000 cubic feet of gas sold. They paid better wages in the larger establishment; and they kept the works at a much higher standard of efficiency. He adopted the 22½ years' purchase, because it brought out a return to the shareholders, which he thought they were entitled to—being a non-statutory Company—of £4 8s. 11d. per cent., or thereabouts. He did not think it would be fair, as a test of value, to base the price on the returns given by statutory Companies, because they had a security which Companies like this had not.

Cross-examined by Mr. CHRYSTAL: A non-statutory Company might have some advantages which a statutory Company had not; but they had not the same security against competition. In Stirling, the consumption of gas was almost entirely domestic. He could not say that the Company had not been supplying gas at a moderate rate. He thought the security of a statutory Company was really more than the cost of an Act of Parliament. He agreed with Mr. M'Gilchrist that it would require fully £6000 to put the works into a thoroughly good condition; but he also agreed with him that better results would then be obtained. He was not going to deny that it would pay the Corporation to take the undertaking at £64,750; but he would not be prepared to close with a higher sum than £61,130. He looked upon £68,320 as an excessive price.

Saturday, March 13.

Sheriff Lees sat again to-day and heard Counsel. On the Wednesday following, he intimated to the Clerk to the Reference that he proposed to fix the price of the undertaking at £62,697 10s. 11d.; and he wished the award made known to the parties, in order that they might have an opportunity to lodge objections if they thought fit.

GERMAN CONTINENTAL GAS COMPANY.

The Report and Accounts for 1896.

We have received a copy of the annual report and balance-sheet submitted on the 24th inst. to the general meeting of the above-named Company, of which Herr W. von Oechelhaeuser is the General Manager. The following particulars are extracted therefrom:—

The year 1896 was distinguished by the largest annual increase in the make of gas since the inception of the Company 42 years ago. The production at all the works was upwards of 100 million cubic feet more than that of 1895. This phenomenal augmentation of the output has been attended by an increase in the net profit earned; and the gratifying result to the shareholders was that a dividend at the rate of 11 per cent., in place of the 10 per cent. of the last eight years, was recommended.

The total gas production in 1896 was 44,510,704 cubic metres (1,571,965,840 cubic feet), or an increase of 6·8 per cent. on that of the preceding year. Of this total, the production at the Warsaw works was 19,851,910 cubic metres (701,101,570 cubic feet), which was an advance of 6·49 per cent. on 1895. The total number of burners in use rose to 446,334, of which 66,227 were on the incandescent system. The number of the latter burners has increased by 44·8 per cent. since the close of 1895. The quantity of gas employed for heating, cooking, and motor purposes rose from 17·74 to 18·74 per cent. of the total consumption. Contracts have been made for the supply of certain suburbs of the towns of Ruhrort and Erfurt. The increased business during the year demanded a larger staff of gas-fitters and workmen; and owing to the great difficulty of securing well-trained and reliable men, it has been decided to establish at Dessau during the current year a training school for the instruction of fitters, &c., for the Company's service. Prepayment meters were extensively tried, and with such success that it is hoped they may in future bring gas within reach of many who would not otherwise use it, as they have been found to do in England and elsewhere. Those furnished by the Company have been designed and made at their Dessau workshops. The advance in the consumption of gas appears to have been due to a special development in the gas industry, and not simply the result of general improvement in trade, as five of the towns served were not affected by the latter.

The length of mains at the close of the year had reached 475·4 miles. The unaccounted-for gas was further diminished, and only amounted to 3·68 per cent. of the year's output. Gas-engines, to the number of 834, giving in all 4105½-horse power, were supplied by the Company, and consumed gas amounting to 10·72 per cent. of the total production. The average yield of gas per ton of coal at all the works was 10,941 cubic feet, and showed a slight improvement on the yield in 1895. The coal carbonized cost on an average rather less than 18s. 2d. per ton, compared with 18s. 6d. in 1895. The coke used for firing the retorts was rather less per ton of coal carbonized. Coke fetched the same price; while that of tar improved considerably, and that of ammonia was lower than in 1895. At every town served by the Company, there were increases both in the gas consumed and in the number of burners in use. The greatest augmentations in consumption were at Ruhrort (19·27 per cent.) and at Dessau (18·33 per cent.). The Dessau increase was in part due to the greater demands of the gas tramway, which now consumes 13·87 per cent. of the gas produced in the town. The electricity supply station at Dessau served more lamps than in 1895; and the cost of production per effective horse-power-hour was considerably reduced.

The gross profit on the year's working was 3,481,406·35 marks (about £170,657); and the net profit, 2,780,251·50 marks (about £136,286). Larger additions have been made to the contingency funds than in 1895; and the customary amount of 10 per cent. of the net profit has been added to the reserve fund. After providing for these contributions, and for the payment of a dividend of 11 per cent., the balance carried to this year's account is 14,016 marks (about £686).

Arbitration Award in Connection with the Welsh Water Scheme of the Birmingham Corporation.—In our issue for Feb. 16, there appeared a paragraph referring to arbitration proceedings in respect of a claim by the Rev. W. Prickard against the Birmingham Corporation for £35,000 for land situated in the county of Radnor, within the area of the new watershed, and consisting of 298 acres of freehold and 2546 acres of a right of pasturage upon common lands. A comparatively small portion of the land is required for reservoir purposes and works; the remainder of the estate being purchased in order to preserve the purity of the water. The Umpire (Mr. C. Oakley) has now published his award, the amount of which is £15,122.

Electric v. Gas Lighting at Douglas (Isle of Man).—A few weeks ago the Douglas Town Council, with a view to the improved lighting of the bay front and the main thoroughfare to Woodbourne, on the outskirts of the town, invited tenders from the Electric Company for lighting by arc lamps, and from the Gas Company for lighting by the incandescent system. The offers have now been received. The Electric Company are prepared to light, free of all cost to the town, the Promenade, the main artery, and the thoroughfare to Woodbourne with 67 arc lamps of 1200-candle power. In return for this, they require leave to work the bay tramway with electric trolley cars, power to lay mains for private lighting, and to lay tramways to the railway station. On the sale of the current, the Company will pay equal to 5 per cent. on the gross income, and 15 per cent. on the gross income of the North Quay tramway. The offer of the Gas Company is to light the Promenade with double 120-candle Welsbach burners for £250 a year; and the remainder of the town at a correspondingly low price. A Committee has been appointed by the Council to consider the offers.

COMMERCIAL GAS COMPANY.

The Half-Yearly Report and Accounts.

The following is the report of the Directors of this Company for the half year ending Dec. 31, 1896, which, with the accounts for this period, will be presented at the meeting of the proprietors next Thursday:—

The Directors submit the accounts for the half year ended Dec. 31, 1896. The revenue account shows a net profit for the half year of £47,447 10s. 1d. This, added to the amount brought forward from the previous half year, makes £55,761 15s. 6d. Deducting therefrom £4028 8s. 8d. for interest on debenture stock and loan, there remains standing to the credit of the net revenue account a balance of £51,733 6s. 10d. available for dividend. The Directors recommend that dividends be declared at the rates of 13½ per cent. per annum upon the old stock of the Company, and of 10½ per cent. per annum upon the new stock, both less income-tax; and that the difference between the declared rates and the authorized rates of 13¾ and 10¾ per cent., having regard to the price charged for gas, be carried to the reserve fund. The balance of the net revenue will be carried forward to the next half year. To meet the requirements of the Company, further capital is necessary; and resolutions will be submitted to the proprietors authorizing the raising of the same in conformity with the Company's Act of 1875.

The accounts accompanying the report consist of the usual statements. The statement of capital stock (No. 1) stands as before—viz., £715,000 paid up, out of a total £830,000 authorized. The statement of loan capital (No. 2) is also unchanged—£165,000 borrowed, out of £300,000 authorized. The capital account (No. 3) shows receipts to the amount of £880,000; but a total of £891,594 0s. 5d had been spent up to June 30, 1896, increased to £908,445 5s. 11d. by the expenditure of £16,851 5s. 6d. (of which £3980 was for buildings, plant, &c., £3416 for mains and services, £2968 for meters and stoves, and £6075 for "coin" meters and fittings) in the six months covered by the report. The capital account has therefore been overdrawn to the extent of £28,445 5s. 11d.

No. 4.—REVENUE ACCOUNT.

To Manufacture of gas—				By Sale of gas—			
Coals, including dues, carriage, unloading, and trimming (see account No. 8)		£69 389 14 10		Common gas, per meter, at 2s. 6d. per 1000 cubic feet	£132,165 16 8		
Salaries of Engineer and Officers at works		2,179 6 8		Public lighting and under contracts, common gas. (See statement No. 10.)	9,611 7 11		
Wages (carbonizing)		30,260 5 3				£141,857 4 7	
Purification, including £2164 2s. 7d. for labour		4,163 5 10		Rental—			
Repair and maintenance of works and plant, materials and labour (less £231 15s. 3d. received for old materials)		17,107 16 5		Meters	£2,188 5 1		
			£113,100 9 0	Stoves	1,047 15 3		
Distribution of gas—				Coin meters and fittings	1,246 16 9		
Salaries and wages of Officers (including Rental Clerks)	£1,537 12 6					4,482 17 1	
Repair, maintenance, and renewal of mains and service-pipes, including labour	2,651 13 7			Residual products—			
Repair and renewal of meters	1,908 19 6			Coke, less £3363 17s. 3d. for labour	£23,198 5 0		
" " stoves	1,397 3 4			Breeze, less £662 13s. 6d. for do.	433 5 7		
" coin meters and fittings	921 12 9			Tar	8,768 0 11		
		8,417 1 8		Ammoniacal liquor and sulphate of ammonia	5,959 5 9		
Public lamps—Lighting and repairing		2,497 13 11				38,358 17 3	
Rents, rates, and taxes		7,509 18 3		Miscellaneous receipts—			
Management—				Rents receivable	£304 15 10		
Directors' allowance	£1,250 0 0			Transfer fees	19 12 6		
Company's Auditors	75 0 0					324 8 4	
Salaries of Secretary, Accountant, and Clerks	1,101 12 1)						
Collectors' salaries and commission	1,425 12 2						
Coin Meter Collection	141 13 3						
Stationery and printing	607 5 2						
General charges	483 3 3						
		5,086 6 8					
Bad debts		462 18 4					
Law charges		130 15 5					
Superannuation		250 0 0					
Official Officers		70 13 11					
		£137,525 17 2				£184,973 7 3	
Balance carried to net revenue account (No. 5)		47,447 10 1					
		£184,973 7 3					

No. 5.—PROFIT AND LOSS (NET REVENUE ACCOUNT).

Interest on debenture stock	£3,712 10 0	Balance, June 30, 1896	£54,935 10 5
Balance of interest on temporary loan	315 18 8	Less—Amount of dividend paid for half year ending June 30, 1896, £45,787 10s., and amount carried to reserve, £890 10s.; and forfeitures, £3 5s.	46,681 5 0
Balance available for dividend, carried to balance-sheet	51,733 6 10		£8,314 5 5
		Balance from revenue account (No. 4)	47,447 10 1
	£55,761 15 6		£55,761 15 6

No. 6.—RESERVE FUND.

Balance on Dec. 31, 1896	£42,480 4 6	Balance on June 30, 1896	£41,589 14 6
		Net Revenue Account (No. 5)	890 10 0
	£42,480 4 6		£42,480 4 6

No. 7.—INSURANCE FUND.

Balance on Dec. 31, 1896	£28,652 7 7	Balance on June 30, 1896	£28,652 7 7
	£28,652 7 7		£28,652 7 7

No. 8.—STATEMENT OF COALS.

Description of Coal.	In Store, June 30, 1896.	Received during the Half Year.	Carbonized during the Half Year.	Used and Sold during the Half Year.	In Store, Dec. 31, 1896.
	Tons.	Tons.	Tons.	Tons. Cwt.	Tons. Cwt.
Common	35,944	109,039	118,902	353 0	25,728 0
Cannel	13,310	948	2,190*	—	12,068 0
	49,254	109,987	121,092	353 0	37,796 0

* 73,318 gallons of petroleum spirit used as a substitute for cannel.

No. 9.—STATEMENT OF RESIDUAL PRODUCTS.

	In Store, June 30, 1896.	Made during the Half Year.	Used during the Half Year.	Sold during the Half Year.	In Store, Dec. 31, 1896.
Coke—tons	7,491	72,530	19,759	50,912	9,350
Breeze—chaldrons	2,260	10,527	—	9,237	3,550
Tar—gallons	284,330	1,189,164	—	1,098,064	375,430
Ammon. liq.—butts of 108 gals.	11,125	41,606	41,468	—	11,163
Sulphate of ammonia—tons	2,165	1,271	—	1,485½	1,950½

No. 10.—STATEMENT OF GAS MADE, SOLD, ETC.

Description of Gas.	Quantity Made. Meter Register.	Quantity Sold. Public Lights and under Contracts (estimated).	Quantity Sold. Private Lights (per Meter).	Quantity Sold. Total Quantity Sold.	Quantity used on Works, &c.	Total Quantity accounted for.	Quantity not accounted for.	Number of Public Lights.
	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	
Common	1,232,661	61,872	1,057,326	1,118,198	19,413	1,137,611	94,990	5,529

BALANCE-SHEET.

Net Revenue—		By Capital—Balance, per account No. 3	£28,445 5 11
For balance, per account No. 5	£51,733 6 10	Cash at Bankers and in hand	10,622 15 2
Reserve Fund—		Amount invested in Consols	66,667 2 1
For balance, per account No. 6	42,480 4 6		
Insurance Fund—		Stores in hand—	
For balance, per account No. 7	28,652 7 7	Coals	£28,762 8 8
Dividends outstanding	2,351 12 7	Coke and breeze	5,293 6 8
Deposits	10,748 10 3	Tar, ammoniacal liquor, and sulphate	21,455 9 2
Interest on debenture stock	223 15 0	Sundry stores	11,119 10 5
Sundry tradesmen and others, for amount due for coals, stores, and sundries	19,413 11 3		66,630 14 11
Loan	110,000 0 0	Accounts due to the Company—	
		Gas and meter rental, quarter ending Dec. 31, 1896	£85,045 19 6
		Arrears outstanding	282 8 7
			85,328 8 1
		For coke and other residual products	£7,224 13 4
		Sundries	764 8 6
			7,989 1 10
	£265,683 8 0		£265,683 8 0

BRITISH GASLIGHT COMPANY, LIMITED.

The Half-Year's Working—The Retirement of Mr. Frederic Lane Linging.

The Half-Yearly General Meeting of this Company was held last Wednesday, at the London Offices, 11, George Yard, Lombard Street, E.C.—Mr. JOHN HORSLEY PALMER in the chair.

The SECRETARY (Mr. H. B. Chamberlain) read the notice convening the meeting; and also the report of the Directors. The latter stated that the balance of profit was £24,831, after deducting the following items, and adding £147 from the Hull reserve fund and £156 from the Trowbridge reserve fund—the parliamentary interest at these stations not having been realized by these respective amounts on the half-year's working. The deductions were as follows: Income-tax, £871; Potteries excess profit, £693; Norwich debenture interest, £437; Potteries debenture interest, £386. With regard to the Hull works, the gas-rental showed an increase of £1656, as compared with that of the corresponding period of 1895. Coke and tar exhibited an increase of £988; but tar distilling, ammoniacal liquor, and sulphate of ammonia, a decrease of £1036. Coal cost 10s. per ton, as against 10s. 1d. Coke realized 8s. 4d. per ton, as compared with 8s. 10d. The gas sent out was 417,362,468 cubic feet, as against 396,719,946 feet. At Norwich, the gas-rental showed the slight decrease of £29; but residuals advanced by £430—the principal increase being on coke. Coal cost 14s. 1d. per ton, as against 15s. Coke realized 5s. 9d. per chaldron, as compared with 5s. 3d. The quantity of gas sent out was 164,088,000 cubic feet, as against 165,345,000 feet. The gas-rental at the Potteries station increased by £1434. Coke, tar, and ammoniacal liquor had yielded an additional £205; but sulphate of ammonia decreased by £143. Coal cost 8s. per ton, as against 8s. 6d. Coke realized 5s. 3d. per ton, as against 5s. 6d. The gas sent out was 158,643,000 cubic feet, as compared with 146,257,600 feet. The gas-rental at Trowbridge showed an increase of £128; and the quantity of gas sent out was 24,799,805 cubic feet, as against 23,582,500 feet. The gas-rental at Holywell was about the same as at the corresponding period of 1895—viz., £1352. Adding the total profit from the various stations to the balance previously standing to the credit of profit and loss, made a sum of £50,393. From this the Directors recommended a dividend at the rate of 10 per cent. per annum, with a bonus of 2s. 6d. per share. The dividend and bonus would amount to £23,625, and leave a balance of £26,763. Referring to the retirement of Mr. Linging, the report said: "The Directors have to report the retirement of the Secretary, Mr. F. L. Linging; and they cannot allow so old and valued an officer of the Company to retire without placing on record their appreciation of the very valuable services so long rendered by him. He has won the entire respect and confidence not only of the Directors, but of all connected with the Company; and the Directors need hardly add with what deep regret they were compelled to accept his resignation. Mr. Linging has been in the Company's service for the last 38 years; and a retiring allowance has been voted to him by the Board."

The CHAIRMAN, in moving the adoption of the report and accounts, said the former went fully into the working results of the half year; and therefore he would merely touch upon some of the subjects affecting the different stations which might be of interest to the shareholders. With regard to Hull, the increase in the consumption of gas there was not so great as in past years. Nevertheless it was a satisfactory increase—viz., 5 per cent.—and everything was going on at that station as the Board desired. Shareholders who closely followed the course of gas events in Parliament would have noticed that the Corporation of Hull were promoting an Act to enable them to purchase the works of the Kingston-upon-Hull Gas Company; and they were also taking power to supply gas purchased either from the British Gaslight Company or the Sutton, Southcoates, and Drypool Company. Thus they were faced by a situation that was rather unique with gas undertakings. The Corporation did not propose to manufacture gas at the Kingston works, because they were in the immediate vicinity of the Town Hall and other large public buildings; and they wished to do away with the nuisance which they thought was created by those works. The Directors had been asked whether they were willing to supply the Corporation with gas in bulk; and they had replied that they were, on certain conditions. Those conditions had not been arrived at yet; and, of course, it would be a matter for the future to decide the price at which the Company would tender. The Directors had not absolutely fixed on a price; and the shareholders might be assured that, while they would be willing to assist the Corporation as far as they could (because they had always been, and hoped they would continue to be, on friendly terms with the Corporation), they certainly would not supply gas, except at such a price as would return a fair rate of interest on the capital which would have to be expended. When he mentioned that the Kingston Company's price was 3s. 3d. per 1000 cubic feet, theirs was 1s. 10d., and the Sutton Company's 2s. 3d., the shareholders would see they had some advantage in the matter. The Company's works at Hull were in perfect order. He visited the station the previous week, and found they had completed No. 4 retort-house on the most approved principle of stage floor and regenerator furnaces, and were now employed in erecting charging and drawing machinery on the Arrol-Foulis system. Turning to the Norwich station, the Chairman said he explained fully, at the last meeting, the details of their settlement with the Corporation in regard to the Bill which the Company succeeded in passing last year. The Directors agreed to give the city gas of a higher illuminating power; and to enable them to do this, they had, by the advice of their colleague Mr. Corbet Woodall, been erecting carburetted water-gas plant. They had hoped it would have been completed by this time; but unfortunately certain difficulties had arisen with respect to the storage of oil and its proper conveyance to Norwich, which was an intricate place to take either coal or oil to. However, the plant was now in an advanced state; and they quite hoped by the middle of the summer to have it in operation. They had had the misfortune of a gas explosion at Norwich. This was not owing to any neglect on the part of the Company; it was a case of *force majeure*. The accident was occasioned by a main running through a *cul de sac* being fractured by frost. The gas found its way, through loose ground, into a house—causing a gas explosion, the death of two persons, and grave injury to a third. The Directors admitted no liability; but they deeply sympathized with the people who were injured, and had authorized the Company's representative to meet the case in a liberal spirit. Having mentioned that, since the accounts were audited, they had found a deficiency in the coal stock at Norwich, and that this would have to be adjusted in future accounts, the Chairman referred to the Potteries station. The business there was progressing, he might say "by leaps and bounds." They had had the satisfactory increase during the half year of 8 per cent. This they attributed to the low charge for gas—2s. 3d. per 1000 cubic feet—indeed, they were the pioneers of low-priced gas in that district. Corporations in the immediate neighbourhood were charging 3s., excepting one, which had come down to 2s. 6d. It was satisfactory to record not only the increase in the quantity of gas produced and sent out, but also the admirable way in which their Manager there (Mr. John Young) conducted the business, because he had, in addition to good engineering capacity, great commercial aptitude; and this was one of the main influences which had led to the success of this station. At Trowbridge, which was one of the smaller stations, they had had an increase of 5 per cent.; and matters had gone on very quietly there. They were dependent a great deal on the cloth trade in the West of England; and this had lately been at rather a low ebb. They would have to spend some money in remodelling these works; but this would be a question for future consideration. He had now to approach a subject which was rather near his heart. He referred to the retirement of Mr. Linging, who had been with them for upwards of 38 years. This was considerably more than half the time that was generally allotted as the span of man's life; and it had been the best half of Mr. Linging's life that had been devoted to the service of the Company. When he came to them, the impetuosity of youth had passed by, and they had the benefit of his mature judgment in all things relating to gas management and secretarial work; and very nobly had his duties been fulfilled. In order to show how greatly Mr. Linging's responsibilities had increased since he was appointed in 1858, he (the Chairman) would like to quote a few figures. The total capital expended up to that year was £196,000; and now it was £674,000. A half-year's dividend in 1858 amounted to £9000; and now they required nearly £24,000. The number of shareholders was then only 290, as compared with 1400 now. These figures pointed to solid and ever-increasing work in the office. But there was a great deal more than that. They had many Acts of Parliament, most of which had been very hotly opposed by the Local Authorities. No less than twelve Acts had been passed during the time Mr. Linging had been Secretary; and some of the shareholders would remember what tremendous contests they gave rise to. Mr. Linging had fought tooth and nail in the interests of the Company, in spite of the most determined opposition of Corporations and the advice tendered by parliamentary experts; and in every case he had come out triumphant. The splendid results which had been attained by the Company in their Acts of Parliament were, in his (the Chairman's) opinion, entirely due to the way in which Mr. Linging had striven for them. He (the Chairman) had been a Director for eighteen years, during the whole of which time he had benefited by Mr. Linging's advice and personal friendship. He had been his mentor and instructor in many things connected with the Company; and to all the shareholders who came to him for advice, and to those with whom they did business, he had been most courteous—in fact, he had done everything to promote the interests of the Company. Mr. Linging had told the Board that the day must come when the sword and pen must be laid down; and, though they had reluctantly put off the evil day as long as they could, the Directors felt the time had now arrived when he should have that rest and retirement which had been so justly earned, and which, he hoped, he would live many years to enjoy.

Mr. HENRY WILKIN seconded the motion, which was unanimously carried.

On the proposition of the CHAIRMAN, seconded by Mr. CORBET WOODALL, the dividend and bonus recommended were declared.

Mr. STEVENS moved, and Mr. GIVENS seconded, that the thanks of the shareholders be accorded to the Chairman and Directors for their services; and this was agreed to.

The CHAIRMAN having responded,

Mr. GEORGE LIVESEY said he thought it would not be right for the meeting to close without an expression of the feeling of the shareholders towards Mr. Linging. The Board had shown their feeling in the most appropriate manner possible—and not only in words; and something more than silent assent to that was required from the shareholders. He had known Mr. Linging, and they had been fast friends, for a great many years; and he (Mr. Livesey) knew that every word the Chairman had uttered in regard to him was perfectly true. Mr. Linging's heart had been in the Company; and he had devoted himself thoroughly to its work and prosperity—indeed, he could say that a very great deal of their prosperity was due entirely to him. He therefore thought that the shareholders should express their feelings regarding Mr. Linging in a resolution. He had not drafted one; but he would suggest that it should read somewhat as follows: "That the shareholders at this meeting desire to express their most cordial sense of the great services rendered by Mr. Linging to the Company during his 38 years of service. They also hope that he may have long life and health to enjoy his retirement, and that they may not be deprived of his advice and assistance." If there was a possibility of putting Mr. Linging on the Board, he was sure it would be gratifying to the shareholders to see him there.

Mr. R. S. GARDINER seconded the resolution, which was heartily and unanimously adopted.

Mr. LINGING said it was not often that he lacked language to express the dictates of his heart; but he was so overwhelmed with the kindness that had been shown him, that really, on the present occasion, he was perfectly incapable of using appropriate language to convey how deeply he felt that kindness. The 38 years that he had passed with the Company had been a source of pleasure to him. They had been years of hard work, it was true; but he had enjoyed that work. And, moreover, from the day he was appointed to the hour in which he was now retiring, he had received so much kindness from the Directors and so much generosity, both in feeling and otherwise, that he could not adequately convey to them how greatly and deeply he appreciated it all. He assured them it was a source of considerable regret that he was compelled to retire from a Company that (if he might use the expression) he had loved. He had entered into his 79th year; and at that age most men had retired. He would have gone

on most willingly, did he not conscientiously think that the interests of the Company were of far more importance than those of the individual. As far back as June last year, he had, in conjunction with the Chairman and Mr. Woodall, a very sharp contest in connection with the Company; and they were successful. He felt then that the period had come (he was at the time really unwell) when he should retire; and he intimated his views to their worthy Chairman, who begged him not to consider it then, but to go on. Out of deference and respect for him, he (Mr. Linging) gave way, and worked on to the early months of this year, when he felt that he must again ask the Board to allow him to place his resignation in their hands. It was then accepted, and accepted in the same language that the Chairman had so kindly used towards him on this occasion. He (Mr. Linging) could dwell upon this theme to a considerable extent; but he would not. It was a pain to him; and he would ask the shareholders to believe that he was deeply impressed with all the kindness they had shown him, and that that day would be borne in the book and volume of his brain unmixed with more worldly matters.

The proceedings then closed.

ALLIANCE AND DUBLIN CONSUMERS' GAS COMPANY.

The Half-Yearly Report and Accounts.

In the report which the Directors of the above-named Company will present at the half-yearly meeting of shareholders to-morrow, they express regret that great depression has been the characteristic feature of the residuals market, principally with respect to tar and sulphate of ammonia; the sum realized from these products in the six months ending Dec. 31, 1896, being £2496 less than in the corresponding period of 1895. The sale of gas, however, increased to the extent of about 10 million cubic feet; but there was, notwithstanding this, a diminution of £3221 in the rental from this source, owing to the reduction of 2d. per 1000 cubic feet, as compared with the second half of 1895. The principal items on the credit side of the revenue account are as follows: Sale of gas, £112,223; rental of meters, £3131; residual products, £22,858. The total receipts in the half year were £138,398. The chief items of expenditure are: Manufacture of gas, £76,312 (coal and cannel costing £52,321, and wages £12,551); distribution, £8078; management, £4989; and abatements and allowances, including gas-engines, £2323. The total expenditure was £98,994; so that there was a balance of £39,404 to go to the profit and loss account. From this there was taken a sum of £5077 to pay interest on debenture stock, &c.; leaving a net gain of £34,327 on the six months' working. The Directors recommend the payment of dividends at the rate of 10½ and 7½ per cent. per annum on the respective shares, which will leave a balance of £759 to be carried forward. The portions of the accounts relating to the manufacturing operations of the Company show that 58,646 tons of coal and 11,114 tons of cannel were carbonized in the past half year; and that 712,455,000 cubic feet of gas were made, of which 643,455,000 cubic feet are accounted for. The following are the estimated quantities of residual products: Coke, 84,996 chaldrons; breeze, 7417 chaldrons; tar, 801,764 gallons; ammoniacal liquor, 1,278,263 gallons.

TORQUAY GAS COMPANY.

The Annual General Meeting of this Company was held last Wednesday —Mr. W. H. Kitson, J.P., in the chair.

In their report, the Directors expressed gratification at the fact that, in spite of the mildness of the past winter, there had been an increase in the consumption of gas. Reference was made to the depressed condition of the market for residuals, but it was stated that, though the price realized for coke was very low, they had been enabled, owing to improvements in the carbonizing department, to sell greatly increased quantities. Prepayment meters were working satisfactorily, and 160 had been fixed since October last. The total receipts were £24,645, including £17,337 for gas from ordinary consumers, and £1725 for public lighting; and the total expenditure was £18,061, of which £13,885 was for the manufacture of gas and repairs to works. The balance carried to the profit and loss account was £6583.

The Chairman, in moving the adoption of the report, explained that the sale of gas reached 127 million cubic feet—the highest point yet attained. The balance carried to the profit and loss account was satisfactory, considering the depreciation in the value of residuals, and also the fact that by reducing the price of gas to 3s. per 1000 cubic feet they had given the consumers an equivalent of almost £1600 on the year. On the credit side of the capital account, they had £2224 as the amount of premiums realized on the sale of 300 £10 shares. This gave an average of £17 8s. 10d. each, which showed the confidence that the public had in the future of gas. The cost of manufacture stood at £13,812, as compared with £16,734 in 1895. The reduction was chiefly in repairs and maintenance of works; but, by the introduction of machinery in the carbonizing department, wages were £100 less, while there had been an increase of 3 million cubic feet in the make of gas. Rates and taxes had increased by £280. This had been a matter of dispute for some time past, and was still unsettled. Though the sale of gas had increased, the amount received from it was £19,063, as compared with £19,796 in 1895—a difference of £730, due, of course, to the reduction in price. The balance carried to profit and loss account this year was £6583, against £5039 in 1895. The Company's mains were 44 miles long; they had 2865 consumers, and there were 821 public lamps in Torquay and 107 in Cockington. The average illuminating power of the gas was 15·95 candles; the parliamentary standard being 15 candles. They were threatened with the rivalry of the electric light. But the experience of other places had shown that there was ample room for both gas and electricity. Their thanks were due to the officials, for the admirable manner in which the business of the Company was carried on.

Mr. J. Watson seconded the motion, and it was carried.

The retiring Directors (Messrs. W. Ball and C. Stapley) were re-elected; as was also Mr. H. Rowe, the Auditor.

The proceedings then terminated.

LEEDS CORPORATION GAS-WORKS.

The Men and Mechanical Stoking—Works Extensions.

At the beginning of last week, by order of the Leeds Corporation Gas Committee, notices were posted in the two retort-houses at the New Wortley gas-works, where mechanical stoking appliances have been introduced, of new working conditions relating to this department which are to come into operation in about three weeks' time. As already reported, some difference of opinion has arisen between the Gas Workers' Union and the Committee as to the number of attendants that should be employed per shift in the retort-house in which stoking machinery is employed. The Union have been contending that fourteen attendants were required in each house; while the Committee have urged that a dozen men were quite sufficient to do the work. In the new rules, one of the clauses stipulates that, in the course of an eight-hour shift, 560 mouthpieces must be drawn and charged. To do this, "There will be four machine men and twelve attendants; but where the lids are luted there will be fourteen attendants. In case of letting down retorts, the number of workmen will be reduced in proportion to the number of retorts let down." In one of the houses, the lids have to be luted; so that in that case there will be fourteen attendants employed, and in the other, where the lids are self-sealing, twelve. It will be seen, therefore, that though the Gas Committee refused to agree to employ thirteen attendants in each house (a compromise which the men's Union had suggested at an interview with the Gas Committee), the aggregate number in the two houses is to be the same—viz., twenty-six.

The Meadow Lane Station Sub-Committee last Tuesday considered various tenders which had been received for work in connection with the proposed new purifying plant. The offer of a local contractor (Mr. G. Cross) for the buildings, amounting to £4760, was accepted; and the tender of Messrs. J. and R. Rankin, of Liverpool, for two horizontal engines, at £567 10s., was successful. The heaviest contract, including valves, steam connections, girders, columns, roof, and principals fell to Messrs. Clayton, Son, and Co., Limited, of Hunslet; their tender amounting to rather more than £7000. The above will, of course, have to be submitted to the Council for confirmation.

WIMBORNE GAS COMPANY'S PROVISIONAL ORDER.

Report of the Board of Trade Inspector.

At a recent Special Meeting of the Wimborne District Council, the Clerk (Mr. H. W. Dibben) stated that he had received a copy of the report which Lieut.-Colonel Yorke had prepared for the Board of Trade as the result of the recent public inquiry which he held respecting the application of the Wimborne Gas Company for a Provisional Order giving them statutory powers (see *ante*, p. 551). It will be remembered that the District Council objected to certain clauses in the Order. Among the principal of them were that the capital which the Company proposed to take up—£20,000—was excessive, and that the standard price of the gas—4s. 6d. per 1000 cubic feet—was also too high; but the Council especially contended that a clause should be inserted in the Order, under which they should have the option of purchasing the business of the Company at its value as a non-statutory concern, for a period of three years from the date of the Order. In the report which the Clerk read to the Council, Colonel Yorke agreed that the capital was excessive, and considered that £17,000, with the usual borrowing power, was ample. He also recommended that the standard price of 4s. 6d. per 1000 cubic feet of gas should be reduced to 4s. 1d.; but he declined to recommend the insertion in the Order of a purchase clause, pointing out that such a course was not usual, except the consent of both parties was obtained. Reviewing all the circumstances of the case, he thought the Company had established their claim to the Order, subject to the amendments which had been agreed upon and the modifications he suggested.

ELECTRIC LIGHTING NOTES.

The Lighting Committee of the Liverpool Corporation have decided to modify their scale of charges for lighting and motive power. The price for lighting is to be reduced, by 1d., to 6d. per unit up to 1000 units per month; and for each unit over 1000, the present charge of 4d. is to be continued. For motors and machinery, the prices are to be: 3d. per unit up to 1000 units per month, and 2d. per unit above 1000—a reduction of 1d. and 2d. respectively.

In last week's issue, brief reference was made to the financial result of the working of the Coventry Corporation Electric Lighting Department during 1896. It was shown that there was a debit balance of £41 on the revenue account; and, adding the interest on capital and payment on sinking fund, made the total charge on the rates £1706. When presenting this statement to the City Council, the Chairman (Alderman Hill) declared that he and his colleagues were proud of it, and considered it highly satisfactory for the first year. According to Mr. West, who seconded the adoption of the report, in January last year, the department had only 31 customers, possessing 1824 lamps, while in December the figures had respectively risen to 72 and 5662. The Committee, he mentioned, had adopted the Brighton system of charging; and under it two of the consumers had had such a reduction in their bills that the cost to them of the electricity used only averaged 4½d. per unit, which was equal to gas at 2s. 7d. per 1000 cubic feet. Some criticisms on the financial position were made by Alderman Andrews, the Chairman of the Gas Committee. He admitted that the supply of electricity was well conducted by the Electric Lighting Committee; but the amount of the deficiency to come out of the rates appeared to him to be enormous. There were only 72 customers; and the £1706 divided among them was something like giving each one £24 out of the rates. Looked at from another point of view, the deficiency would absorb something like half the profits on the gas undertaking. The latter provided annually a profit of about 6d. in the pound on the rates; and the deficiency on the Electric Light Department was equivalent to 3d. in the pound out of that profit,

or thereabouts. His own impression was that Mr. West was much too sanguine when he said that electric light at 4½d. per unit, was equivalent to gas at 2s. 7d. per 1000 cubic feet. It seemed to him (Alderman Andrews) that the finances were not altogether in what he should call a satisfactory condition; and he felt sure the department would have to increase the price to make both ends meet. Mr. Booth considered it hardly fair to say that the "loss" on the undertaking had been £1706, seeing that £769 of this sum went into the sinking fund for the repayment of borrowed capital. The only loss was £895 interest with £41 added. The report was adopted.

The Board of Trade have decided to grant a Provisional Order to the Wimbledon Urban District Council, authorizing them to supply electricity within their district, and to expend £32,000 for the purpose.

The Eastbourne Electric Lighting Company is one of the few concerns of this description which is in a flourishing condition in the provinces. Started in 1882, the dividend for the first ten years was very small; in 1892, it was 3 per cent.; 1893, 5 per cent.; and 1894, 7½ per cent. This is to be the payment on the past year's working. At the end of December, the lamps fixed were equivalent to 16,690 of 8-candle power, as compared with 14,754 at the end of 1895.

The Bolton Corporation having applied to the Local Government Board for sanction to borrow £30,000 for extensions at the electricity works, an inquiry was held there on the 17th inst., by Major-General H. D. Crozier, R.E., one of the Board's Inspectors. It was explained by the Town Clerk (Mr. R. G. Hinnell) that the works were established in 1894, and that the £40,000 sanctioned by the Department had been overspent by £6773, so great had been the demand for the electric light by tradesmen and others. The Borough Electrical Engineer (Mr. A. Ellis) stated that the amount in excess of the original estimate had been expended on an extension of the engine and boiler house, and in connection with additional plant. The Inspector sharply criticized the original estimates, and said that in these electricity schemes he generally found that the figures first put forward were a mere farce. The original estimate for the buildings at Bolton was £5525; but £10,525 had been expended. He also found fault with an item of £1820 in the accounts, under the head of "contingencies." Mr. Ellis said that they had had to expend money on the new alteration, which had not yet been paid for. The Inspector asked what business they had to spend money in this way, and put it down to "contingencies." The Town Clerk replied that they were something which had not been estimated for. The Inspector next wished to know why it was that the Manager's salary had been charged to capital. The Borough Treasurer (Mr. G. Swainson) answered that this was done during the erection of the works; and he added that it was sound finance. The present year's salary had been charged to revenue. At the conclusion of the inquiry, the Inspector visited the works.

Having acquired the electric lighting undertaking, the Exeter City Council have suddenly discovered that they want to experiment with a view to improving the street lighting of the city. At a meeting of the Council last Wednesday, the Electric Lighting Committee recommended that, with a view to lighting the principal streets by electricity, notice should be given to the Gas Company to determine the existing contract for public lighting at Michaelmas next. Alderman Domville tried to soften the blow by stating that the Committee wanted to try an experiment in High Street, or another place, to see whether arc or incandescent lighting was the better system. They could not give up any of the lamps without the consent of the Gas Company; and though it was not intended that the Company's contract should cease, there was no reason why the Council should be paying for both gas and electricity during the continuance of the experiments. Eventually the Corporation would look forward to lighting the streets themselves; but this would be when they had larger works. Mr. Williams referred to the failure of the light on a recent Sunday evening, when some of the churches and chapels were thrown into darkness, and many private persons were inconvenienced. In face of this experience, he thought it premature to talk of giving notice to the Gas Company to cease lighting the streets. Mr. Linton explained that the failure on the occasion referred to was due to the rain water getting to the cables, which would not occur again. Mr. Dunn thought the Committee were using a sledge-hammer to crack a nut, when they talked of determining the whole contract in order to try some experiments with street lighting. This remark elicited from the Town Clerk the explanation that, if notice were not sent in now, it could not be given for two years and a half. The contract was terminable at three, five, or seven years. The Corporation paid the Company nearly £4000 a year. With the further remark from Mr. Perry that notice could be given to the Company without showing any antagonism, and that the Committee wanted to make the electric light works a great success, the Council came to a decision in favour of the Committee.

An alluring little scheme of electric lighting has been proposed for Bude and Stratton by Mr. F. A. Headley, of St. Austell. He estimates that Bude will require 40 or 50 public lamps, and Stratton 30; and that Bude will contribute customers for 1200 private lamps, and Stratton 300 to 400. It is suggested that the system of supply should be by continuous current at a pressure of 240 volts. The estimated cost is about £3000. The total revenue expected is £780—£180 from public and £600 from private lamps. The annual expenses would be about £360; and deducting £150 for depreciation and reserve, there would be £270 for dividends. The rosiness of the scheme is properly toned down a little by the remark that this "result is not contemplated in the first year."

There are instances in which an installation of the electric light for public purposes has advantages over other systems of lighting; and the village of Treeton, near Rotherham, is an example of this. For some time past, the ruling authority have been considering the question of lighting the streets; and their inquiries have extended to paraffin, gas, and electricity. The first they find would be too expensive; and to put down a gas plant would mean an expenditure of £3000. But in regard to electric lighting, a local colliery company has offered to provide the power and dynamo. Consequently the Parish Council gave a unanimous vote in favour of this system; and they have obtained a tender to carry out an installation for £593. They have applied to the Local Government Board for a loan of £600; and an inquiry has been held. It was stated thereat that the annual outlay would not exceed £150; and of this something like £100 will be provided by property owners—the remainder being made up by a rate of 1d. in the pound. Under the scheme, 3½ miles of streets will be lighted.

INCANDESCENT GAS v. ELECTRIC LIGHT.

The "Midland Evening News" for last Wednesday contained the following letter on the above subject, addressed to the Editor by Mr. A. J. Gilmore, of Worcester Street, Wolverhampton. It contains an interesting comparative statement, which readers will doubtless fully appreciate.

A short time ago, I saw an account in the local Press of an interview a reporter had with our worthy Borough Electrical Engineer (Mr. F. Harman Lewis); and, if I remember aright, Mr. Lewis was reported to say that the cost of the electric light was only 25 to 30 per cent. more than gas, taking it light for light. Having been a consumer of the electric light for over twelve months, I claim to know something of its cost as compared with incandescent gas-light; and had it been my fortunate experience to find Mr. Lewis's estimate even approximately correct, I should have hesitated before abandoning electricity, and incurring the extra expense of incandescent gas-fittings. The following is a true and impartial statement of facts and figures, which speak for themselves:—

Worcester Street Shop.

Cost of Electric Light for 12 Weeks, from Sept. 30, 1896, to Dec. 22, 1896:—				*Cost of Incandescent Gas-Light for 13 Weeks, from Dec. 22, 1896, to March 22, 1897:—*			
Consumed 388 units, at 6d.	£9	14	0	Consumed 22,300 cubic feet, at 2s. 6d. per 1000	£2	15	9
Rent of meter	0	3	2	Rent of meter	0	1	6
Cost of renewing 16-candle power lamps during quarter	0	15	9	Cost of renewing mantles and chimneys during quarter	0	13	3
Total	£10	12	11	Total	£3	10	6
Total Candle-Power Light given:—				*Total Candle-Power Light given:—*			
15 small lamps, 16-candle power each			240	18 Welsbach incandescent gas-burners, 60-candle power each			
2 larger lamps, 32-candle power each			64				
3 large lamps, 100-candle power each			300				
Total light equal to			604 candle power.	Total light equal to			1030 candle power.

For the purpose of comparison, nothing could be more equitable than the selection of these two quarters; the full number of lights being in regular use for the same number of hours per diem. If anything, the electric light has been favoured, as it will be noticed that during Christmas week (the heaviest week in the year) the incandescent gas-light was used instead of the electric light. The above are incontrovertible facts; and the accounts are open to any person who cares to investigate them. I hold no brief for the Gas Company; but, on the contrary, as a ratepayer who must take his share of responsibility *re* the Corporation electric lighting scheme, nothing would give me more pleasure than to see it a success. From my own experience as a consumer, can it be wondered at that I have the gravest doubts of it under the existing conditions? I write this in justification of those who, after trying the electric light, have abandoned it.

EAST LONDON WATER-WORKS COMPANY.

The Half-Yearly Report and Accounts.

The report of the Directors of the above-named Company, with the accounts for the six months ending Dec. 25, 1896, has been issued, in view of the half-yearly general meeting of proprietors next Thursday. The revenue from all sources was £164,843, as compared with £160,366 in the corresponding half of 1895—an increase of £4477. The expenditure on maintenance was £59,456, and on management £11,945—together £71,401—as compared with a total of £73,376 in 1895; being a decrease of £1975. There was an increase of £4354 in the water-rates; and this fact, coupled with the diminished expenditure, the Directors regard as satisfactory. They state that the extensions of works, machinery, and mains, are proceeding expeditiously and satisfactorily; and that the whole of the plant is in excellent condition. Every attention has been paid to the instructions of the Parliamentary Committee that the new works sanctioned in 1894 should be pushed on with all expedition; and the Directors can safely say that they will be completed well within the stipulated time. The quantity of water pumped in the six months covered by the report was 7,708,950,849 gallons, the whole of which has been certified by the Government Official, as well as by the Analysts acting on behalf of the Water Companies, to have been pure and well filtered. The new services laid on numbered 2959, as compared with 2867 in 1895. The total number of services is now 188,185. Brief references are made to the promotion of the Company's Bill in the present session, and to the rejection of the Purchase Bills of the London County Council. The Directors recommend a dividend on the ordinary stock at the rate of 3½ per cent. for the half year (less income-tax). This will absorb £60,219, and leave an unappropriated balance of £8788.

THE LONDON COUNTY COUNCIL AND THE WATER QUESTION.

At the Meeting of the London County Council last Tuesday—Dr. Collins in the chair—Mr. Benn called attention to a short paragraph in the report of the Parliamentary Committee, recording the fact of the rejection of the Chelsea Water (Purchase) Bill, and the subsequent withdrawal of the remaining Bills promoted by the Council. He said the rejection of these Bills represented the interment of the fruit of years of labour by the Council. He thought some alteration in the policy of the Committee should be arranged before they spent more of their time, as well as the ratepayers' money, on such Bills. It might be more convenient to ask Mr. Boulnois, who was the real leader of the Moderate party, for

permission before they proceeded any further with their parliamentary business. With regard to their water policy, they were distinctly in the hands of the Chairman of a Water Company; and the sooner they recognized it the better. He looked upon the rejection of the Bills as the last and most disgraceful act in the whole business. Mr. Westacott denied that the Moderates were more advocates of the Water Companies than were the Progressives. All they desired was to have information, which had hitherto been denied them, as to the effect which purchase would have on the rates of London; and the proposed Royal Commission would obtain it. He regarded the rejected Bills as monstrous proposals, and said he believed the Government had taken the right course. The Moderates were anxious to have the question settled on terms which would be fair to all parties. Sir J. Lubbock, Bart., M.P., said he thought Mr. Benn's reflections upon Mr. Boulnois were quite unfounded, and the honourable character of that gentleman ought not to be subjected to such animadversions. Mr. Benn had suggested that Mr. Boulnois was acting in the interest of the West Middlesex Water Company and not in that of the ratepayers; but the fact was that the Company were limited to a 10 per cent. dividend, and any additional profit must go to the consumers. Mr. Boulnois, M.P., said he did not wish to reply to Mr. Benn's imputations; being satisfied to leave his conduct in the hands of his colleagues. As to the rebate allowed to the consumers of the West Middlesex Company, he was afraid they might lose it in the future owing to the stringent requirements of the Council under what was known as the Chamberlain clause. Mr. M'Kinnon Wood, the Chairman of the Parliamentary Committee, characterized the appointment of another Commission as only trifling with the water question, in pursuance of a dilatory policy. The matter then dropped.

HALIFAX WATER-WORKS EXTENSIONS.

Local Government Board Inquiry.

An inquiry has been held at Halifax by Major-General H. D. Crozier, acting on behalf of the Local Government Board, respecting an application by the Corporation for power to borrow, among other sums, £25,000 for water-works purposes. It was explained by the Town Clerk (Mr. Keighley Walton) that the money was required for the purchase of property at Gibbet Hill, and for the estimated increase in the cost of supplying water during the next five years. The property in question had been purchased by auction (including legal costs) for £1740. Evidence was given by Mr. J. A. Paskin (the Water Engineer) to the effect that he had made an estimate of the probable requirements of the town for the next five years, and he calculated that, consequent on the extension of main pipes and the replacing of small mains by larger ones, £4600 per annum would be needed. Replying to the Inspector, the Town Clerk stated that, under the Water Act, the Corporation might, independently of any borrowing powers, borrow sums not exceeding £180,000 for a specific purpose—viz., the extensions of reservoirs. They had spent about £7000 or £8000 of the £180,000 for the purchase of land with that object; and now they were asking for money for the extension of the mains in new streets, and for replacing old ones. The Inspector remarked that, before the Local Board authorized these loans, they wanted to know what had become of the money sanctioned in the past. When new mains were required, and old ones had to be taken up, the Board wished to see what money was outstanding on the old mains. If inadequate mains had been laid, and had to be taken up before they had been down thirty years, the Council would have to make good the loss. Here, it was alleged, they had done this; and he doubted whether the Local Government Board would sanction these mains without some statement as to the roads in which they were to be laid. The Town Clerk remarked that the Council would like the loan to be granted for forty years. The Inspector thought the Town Clerk was well aware that the Local Government Board never sanctioned such loans for more than thirty years.

Tynemouth Gas Company.—The report which the Directors of this Company had prepared for presentation at the annual meeting of the shareholders yesterday states that the revenue for the year ended Dec. 31, 1896, was £34,049, and the expenditure £27,290—leaving a balance of £6759 as profit. There was also a balance of undivided profit of £905 from last year; making a total of £7664. The Directors proposed to deal with this as follows: Interim dividend of 5 per cent. on the original stock, and 3½ per cent. on the new share capital, £2885; second half-year's dividend, at the same rates, £3000; plant renewal fund, £1000; and reserve fund, £308—carrying forward the balance of £470. The Directors also reported that, the threatened opposition to the Company's Bill by the Town Council and the Whitley and Monkseaton District Council having been withdrawn, it would now go before Parliament as an unopposed measure. The Engineer (Mr. W. Hardie, jun.) was again able to give a satisfactory account of the condition of the works and distributing plant.

Johannesburg Water Company.—The "Financial News" on Monday last week contained a special dispatch giving a short report of the meeting of the above Company on the 19th inst. The Chairman (Mr. Joel) drew attention to the prosperous condition of the Company, which showed a surplus revenue over expenditure for the past year of £45,000. He also gave a list of the townships, embracing suburban districts on every side of Johannesburg, where the Company had the exclusive right to supply water. Mr. Barnato followed, and stated that the present supply of water, in spite of past troubles, was 250,000 gallons daily in excess of the demand. Replying to a statement that had been made, that the Company was on the down-grade, he cited figures to show the steady increase in revenue during the past six years. He ridiculed the suggestion that rival schemes would be successful, as the Company had their own contracts in the townships named as the area for these schemes, where the bulk of the water was consumed; and consequently any other supply could only have a very limited area available. It was also pointed out that, though the Company had no absolute or direct monopoly, they had created one for themselves by their past policy of purchasing suburban estates, on which, though they were disposed of, they retained all their rights in regard to the exclusive supply of water.

NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

There was an undoubted element of sadness in the proceedings in the Edinburgh Gas-Works on Thursday afternoon, when Mr. Mitchell was presented by his workmen with a valuable gift, in token of their respect and esteem for him. Mr. Mitchell himself admitted it. Life is full of partings and regrets, mostly of small moment, but none the less real. Sometimes one which is more keenly felt than the others arises; and this was one of the major occasions. Mr. Mitchell has been for sixteen years Manager in the Edinburgh works. When he entered them, they were old-fashioned, as things are looked upon now; and he has transformed them into modern works. It may almost be said that there is scarcely one stone upon another which he has not thrown down and rebuilt. The works are thus more peculiarly his own than is usually the case with managers. There is also the fact that all this re-modelling, transforming, and extending of works could not have been effected without the assistance and co-operation of trusted assistants. The thought, then, of his having to leave the works, which were his own creation, and the staff which he had gathered around him, could not fail to operate on the emotions of the company. Even the thought of his having to relinquish the constant struggle waged so long with inadequate works, must have been an element of regret to Mr. Mitchell himself. But though these feelings were uppermost, there is, on reflection, found to be room for congratulation, if not for actual joy. Mr. Mitchell is still with us. Released from the harassments of office, his health may improve; and in the gifts which he received, there was the most tangible expression of affection on the part of his workers—the people who know him best—which anyone could wish. Retirement, for Mr. Mitchell, therefore, is not without its consolations. I am sure the wish of everyone who knows him is that he may keep well in health, and that life's brightest side may long be presented to him.

Before leaving the subject, it will not be out of place to refer to one phase of Mr. Mitchell's work in the city of Edinburgh, which may have escaped attention. This is the extraordinary increase in the output of gas. In sixteen years, it has doubled. It was no wonder that, as Mr. Alexander said, the works could never get ahead of the consumption. To meet such a rapidly increasing demand for gas, extensions must have been continually either under consideration or in process of being executed; there could be no period of rest for the man in charge of works of this kind. The area of the works is 4½ acres. I see that Mr. Herring, who is to succeed Mr. Mitchell, in his work entitled "The Construction of Gas-Works," allows an area of 2¼ acres for a works to produce 100 million cubic feet of gas per annum. He will find, when he takes up his duties in Edinburgh, that he will have to manufacture ten times this quantity of gas upon a site which is practically just double the size. This is a state of matters which cannot go on much longer. A site must ere long be found for new gas-works, unless relief can be had in the Leith works, which I very much doubt. But this is not what I wanted to point out. It was the increasing toil and worry which Mr. Mitchell underwent—a condition of existence which was bound, sooner or later, to break down the most buoyant of temperaments, and to ruin the strongest of constitutions.

A Sub-Committee of the Gas Committee of the Dundee Town Council met on Thursday to consider the subject of acquiring ground for the proposed extension of the Corporation Gas-Works. They resolved to instruct the Manager (Mr. W. M'Crae) to report to them on the following points: (1) Whether the area of ground now occupied by the gas-works is fully utilized, or whether additional ground is required for the accommodation of the works and extensions. (2) What extensions are required, and what area of ground is needed. (3) Whether it is necessary, at the present time, to acquire further ground to the eastward; and, if so, to what extent? There is evidently under these questions a distaste for the spending of money upon the works, which bodes no particular good to the gas undertaking.

After discussing the proposal for a considerable time, the Corporation of Edinburgh have resolved to vote a sum of £4050 out of the revenue for the current year, in the electrical department, for a reserve fund for renewals of plant. In recommending the proposal, Mr. A. D. Mackenzie, the Convener of the Electric Lighting Committee, said that about 3½ years ago, the Council decided to keep the electric lighting undertaking in their own hands, and to spend about £100,000 upon the installation. It wanted a few weeks yet of two years since the station was opened; but the demand had been so great that the total expenditure sanctioned up till now was close upon £250,000. This was a very heavy liability to put upon the city; and though their success hitherto had been unprecedented, the Committee felt it their duty to look forward, and recommend the Council to make all reasonable provision for future success. At the beginning of the financial year 1895-96, when the station began running, the undertaking was owing the rates £5900. This money was used in paying the interest and contributions to the sinking fund up till the opening. When the accounts were made up, after 13 months' working, on May 15 last, it was found that there was a balance of income over expenditure of £3900. This sum the Committee intended formally to hand over to the Treasurer's department in part payment of the debt of £5900 with which they began; leaving £2000 still against them. The balance of income over expenditure for the current year was estimated five weeks ago by Professor Kennedy at £6850. They had good reason for believing that this estimate was likely to be exceeded, and that in all probability the balance would be £7000 for the current year. Out of this balance, the Electric Lighting Committee proposed to set aside £4050 towards a reserve fund, in terms of the Act of Parliament—leaving £2850 to be disposed of; and in due time, when the accounts were made up for the current year, they proposed to pay to the Treasurer's department the £2000 still owing, which, along with the £3900 from last year, would put them in the position of not having cost the ratepayers one penny. They thought that £4050 was a reasonable sum to set aside this year to form the fund; and he did not believe that any business men looking at the undertaking, with a debt of a quarter of a million upon it—a debt which was bound to increase—would think their proposals unreasonable. They had already tapped the best-paying districts of the city. Extensions in the future would not pay as well as in the past. They were face to face with a large expenditure which would not be directly remunerative.

They must, before the end of the present century, erect another station in the east end of the city; and they must at once secure land and erect buildings for stores, and very soon have their office buildings and engineer's house erected at Dewar Place. He would not venture to say exactly how much all this would cost; but he would not be surprised if these works and necessary extension of mains, with what had already been spent, did not amount to a capital expenditure of £400,000. When this point was reached, those in charge of the undertaking would be able to judge what further provision should be made.

The Edinburgh and District Water Trustees are inviting tenders for the construction of their new reservoir at Talla, one of the head waters of the River Tweed. The reservoir is to be of 300 acres in area, and of a capacity of 2750 million gallons. Solid rock has been found for the foundation of the embankment, at a depth of about 30 feet; but the specifications have been drawn to cover an excavation of 10 feet more, if it should be necessary. A railway for the conveyance of materials to the new reservoir is all but completed. There is no clay on the site. It was thought at one time that clay would be found at Broughton; but what has been discovered is not well adapted for puddle work, and so clay is to be procured from Carluke, in the valley of the Clyde. The estimated annual rainfall in the district was 32 inches; but in order to fix the amount of compensation water, gauges have been put down, to be kept in use for seven years. These have shown that at some of the higher altitudes—about 2600 feet above sea-level—there is an annual rainfall of as much as 70 inches.

CURRENT SALES OF GAS PRODUCTS.

LIVERPOOL, *March* 27.

Sulphate of Ammonia.—There has been a quiet market all through the week, resulting in a further decline in values; the closing quotations being £7 17s. 6d. to £8 per ton, delivered f.o.b. at the ports. There is still great scarcity of direct export orders, while dealers have been buying very sparingly; so that demand altogether has not been sufficient to remove supplies. Home requirements have been fairly satisfactory. The London quotation has been reduced to £7 16s. 3d. per ton, Beckton terms; while for April-May £7 15s. per ton would be accepted. In the forward position, "bear" speculators have been offering at a substantial discount on prompt prices; and this has no doubt had its effect in deterring purchasers in the prompt and early position.

Nitrate of Soda.—This market is also unaccountably quiet for the time of year; the spot quotations being 8s. per cwt. for good up to 8s. 3d. for fine quality. There being fewer due and arrived at port of call cargoes offering, values have improved to 8s. to 8s. 1d. per cwt. according to size and test.

LONDON, *March* 27.

Tar Products.—Generally speaking, business is dull; and, although pitch is moving more freely, and a little more inquiry exists for it for forward delivery, there is no marked improvement in price. Benzol market reports are unsatisfactory; but there is little or no business being done at the low prices mentioned. Makers are well sold; and buyers are eager for deliveries, although prices are very much above to-day's quotations. Carbolic is firm in all positions, although no important business is mentioned. Much lower prices for tar are being taken.

Average values to-day are: Tar, 15s. to 21s. Pitch, 21s. to 23s. 6d. Benzol, 90's, 2s. 6d.; 50's, 2s. 3d. Toluol, 2s. Solvent naphtha, 1s. 7d.; crude, 30 per cent., naphtha, 11½d. Creosote, 1½d.; liquid, 1¾d. Heavy oils, 37s. 6d. Carbolic acid, 2s. 6d. Naphthalene, 57s. 6d.; drained salts, 25s. Anthracene, "A," 8¼d.; "B," 7d.

Sulphate of Ammonia is weaker; and, at the moment, the market is in the hands of buyers. To-day's quotation is £8, less 3½ per cent. at all ports.

COAL TRADE REPORTS.

From Our Own Correspondents.

Lancashire Coal Trade.—Business shows a gradual quietening down; and most of the collieries are now not working more than four-and-a-half to five days per week. There is still a fairly brisk demand for iron making, steam, and general manufacturing requirements; but supplies are more plentiful in the market, and low figures have to be taken to secure orders. At the pit mouth, best Wigan Arley remains at about 10s. to 10s. 6d. per ton; seconds Arley and Pemberton four-feet, 8s. to 8s. 6d.; and steam and forge coal, 5s. 9d. to 6s. With regard to engine fuel, supplies are not quite so excessive as they have been recently; and there is scarcely the same pressure to sell at under current rates. Quoted prices are steady at from 3s. to 3s. 6d. per ton for common slack; 3s. 9d. to 4s. 3d. for medium; and 4s. 6d. to 4s. 9d. for best sorts. In the shipping trade a quiet tone is reported generally; and the orders coming forward are of very limited weight, with no improvement in prices, which remain at about 7s. 6d. to 7s. 9d. per ton for ordinary steam coals, delivered at the Garston Docks or the High Level, Liverpool.

Northern Coal Trade.—In the coal trade of this district, there has been a larger export of coal, which in degree counterbalances the diminished consumption at this time of the year; and there has been the settlement of some of the contracts that are usually decided at this period. Best Northumbrian steam coals are steadier at from 7s. 9d. to 8s. per ton f.o.b. for immediate delivery; but over the shipping season, a higher price is asked. Steam small coals are rather scarcer, and command from 3s. 3d. to 3s. 6d. per ton f.o.b. In the gas coal trade, there has been the settlement of some of the contracts for large users. Part, at least, of the South Metropolitan contracts are concluded at 6s. 6d. per ton f.o.b.—a price which is about 3d. per ton above the rate that was paid under the contracts entered into last March. Another contract is that for Woolwich—some 20,000 tons or thereabouts of gas coals—and this is settled at prices that are expected to yield 6s. 6d. per ton f.o.b. Other and even more important contracts are in course of negotiation; but it is expected that the result will be on somewhat similar lines to those just named. There is no alteration in gas coke this week.

Scotch Coal Trade.—There is little change to record in the coal market. The demand continues steady; and prices are practically unchanged. There is a large home consumption in industrial circles; and the shipping section appears to be looking up. The Baltic is

GAS AND WATER COMPANIES' STOCK AND SHARE LIST (see ante, p. 708).

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p. c.	GAS COMPANIES.			£ s. d.
590,000	10	15 Oct.	10½	Alliance & Dublin 10 p. c.	24–26	..	4 0 9
100,000	10	,,	7⅞	Do. 7 p. c.	17⅞–18⅛	..	4 1 1
300,000	100	2 Jan.	5	Australian (Sydney) 5% Deb.	108–111	..	4 10 11
200,000	10	29 Oct.	5	Belgrano (B. Ayres), Limited	9½–10	..	5 0 0
100,000	Stck.	30 Dec.	5	Do. 5 p. c. Deb. Stk	102–105	..	4 15 3
200,000	5	12 Nov.	6½	Bombay, Limited	6½–7½	..	4 6 8
40,000	5	,,	6¼	Do. New, £4 paid	5–6	..	4 6 8
380,000	Stck.	26 Feb.	12	Brentford Consolidated	285–293	..	4 2 9
240,000	,,	,,	9	Do. New	223–228	..	3 18 7
50,000	,,	,,	5	Do. 5 p. c. Pref.	138–143	..	3 9 11
159,375	,,	11 Dec.	4	Do. 4 p. c. Deb. Stock.	130–134	..	2 19 9
220,000	Stck.	26 Mar.	11½	Brighton & Hove Original	267–272*	+¾	4 4 7
208,820	,,	,,	8½	Do. A Ord. Stk.	194–199*	+½	4 5 4
933,500	Stck.	26 Feb.	5	Bristol, 5 p.c. max.	130–135	+2	3 14 1
420,000	20	26 Mar.	11½	British	56½–57⅝*	+½	3 18 3
50,000	10	26 Feb.	11½	Bromley, Ordinary 10 p. c.	23–25	..	4 12 0
71,000	10	,,	8½	Do. 7 p. c.	18–20	..	4 5 0
500,000	10	15 Oct.	6	Buenos Ayres (New) Limited	9½–10	–¼	6 0 0
200,000	100	2 Jan.	6	Do. 6 p. c. Deb.	101–103	..	5 16 6
150,000	20	26 Feb.	8½	Cagliari, Limited	29–31	..	5 6 5
100,000	10	30 Sept.	6	Cape Town & District, Ltd.	15⅞–16⅞	..	3 12 9
50,000	50	3 Nov.	6	Do. 6 p. c. 1st Mort.	57–59	..	5 1 8
550,000	Stck.	15 Oct.	13⅛	Commercial Old Stock	344–349	..	3 17 4
165,000	,,	,,	10⅝	Do. New do.	255–260	..	4 0 9
165,000	,,	11 Dec.	4½	Do. 4½ p. c. Deb. do.	150–155	..	2 18 0
800,000	Stck.	30 Dec.	13	Continental Union, Limited.	255–260	–5	5 0 0
200,000	,,	,,	10	Do. 7 p. c. Pref.	215–220	..	4 10 11
51,600	Stck.	26 Feb.	14	Croydon Com'cial A 10 p. c.	315–320	..	4 7 6
163,400	,,	,,	11	Do. B 7 p. c.	250–255	..	4 6 3
535,000	Stck.	26 Feb.	5¼	Crystal Palace Ord. 5 p.c. Stk	140–144	..	3 12 11
60,000	,,	,,	5	Do. 5 p. c. Pref.	140–143	..	3 9 11
486,090	10	29 Jan.	11	European, Limited	24½–25½	–½	4 6 3
354,960	10	,,	11	Do. £7 10s. paid	17½–18½	..	4 9 3
5,896,590	Stck.	12 Feb.	12¾	Gaslight & Coke, A, Ordinary	308–313	–3	4 1 5
100,000	,,	,,	4	Do. B, 4 p. c. max.	110–114	..	3 10 2
665,000	,,	,,	10	Do. C, D, & E, 10 p. c. Pf.	307–312	..	3 4 1
30,000	,,	,,	5	Do. F, 5 p. c. Prf.	145–150	..	3 6 8
60,000	,,	,,	7½	Do. G, 7½ p. c. do.	210–215	..	3 9 9
1,300,000	,,	,,	7	Do. H, 7 p. c. max.	207–212	..	3 6 0
463,000	,,	,,	10	Do. J, 10 p. c. Prf.	307–312	..	3 4 1
476,000	,,	,,	6	Do. K, 6 p. c. Prf.	178–183	+1	3 5 7
1,061,150	,,	11 Dec.	4	Do. 4 p. c. Deb. Stk.	137–142	..	2 16 4
294,850	,,	,,	4½	Do. 4½ p. c. do.	150–155	..	2 18 1
908,000	,,	,,	6	Do. 6 p. c. do.	207–212	..	2 16 7
70,000	10	29 Oct.	6	Hongkong & China, Limited	12–13	..	4 12 4

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p. c.	GAS COMPANIES.			£ s. d.
3,800,000	Stck.	12 Nov.	12	Imperial Continental	210–215	–2	5 11 7
376,400	100	1 Feb.	4	Do. 4 p. c. Debs. Red.	99–102	..	3 18 5
473,600	Stck.	12 Feb.	3½	Do. 3½ p. c. Deb. Stk ,,	104–107	..	3 5 5
75,000	5	11 Dec.	6	Malta & Mediterranean, Ltd.	5⅞–6¼	..	4 16 2
560,000	100	1 Oct.	5	Met. of Melbourne, 5 p. c. Deb.	113–115	..	4 6 11
250,000	100	,,	4½	Do. 4½ p. c. Debs.	109–111	..	4 1 1
541,920	20	12 Nov.	5	Monte Video, Limited	15–16	..	6 5 0
150,000	5	26 Nov.	8	Oriental, Limited	8¼–9	..	4 8 11
135,000	5	,,	8	Do. New, £4 10s. paid	7⅛–8	..	4 10 0
15,000	5	,,	8	Do. do. 1879, £1 paid	1⅞–2	..	4 0 0
60,000	5	26 Mar.	7	Ottoman, Limited	5–5⅛*	+⅛	6 7 3
420,000	100	2 Nov.	6	People's Gas } 1st Mtg. Bds.	104–109	+4	5 10 1
500,000	100	1 Dec.	6	of Chicago } 2nd Do.	104–109	+4	5 10 1
250,000	10	30 Sept.	10	San Paulo, Limited	13⅜–14⅜	..	6 18 0
5,475,000	Stck.	26 Feb.	5½	South Metrop., 4 p.c. Ord.	143–146	–1	3 11 11
850,000	,,	14 Jan.	5	Do. 5 p. c. Deb. Stk.	173–177	..	2 16 6
60,000	Stck.	12 Mar.	11½	Tottenham & Edmonton, A	275–285	..	4 0 10
60,300	,,	,,	8½	Do. B	190–200	..	4 5 0
182,380	10	30 Dec.	10	Tuscan, Limited	14–15	..	6 13 4
149,900	10	2 Jan.	5	Do. 5 p. c. Debs. Red.	101–103	..	4 17 1
				WATER COMPANIES.			
746,159	Stck.	30 Dec.	10½	Chelsea, Ordinary	333–338	..	3 2 2
150,000	,,	,,	5	Do. 5 p. c. Pref.	175–180	..	2 15 6
160,000	,,	,,	4½	Do. 4½ p. c. Pref. Stk., 1875	158–162	..	2 15 6
175,785	,,	26 Mar.	4½	Do. 4½ p. c. Deb. Stock	160–165*	+½	2 14 6
1,720,560	Stck.	15 Oct.	7	East London, Ordinary	225–230	..	3 0 10
654,740	,,	30 Dec.	4½	Do. 4½ p. c. Deb. Stk.	162–167	..	2 13 11
225,000	,,	,,	3	Do. 3 p. c. Deb. Stk.	106–108	..	2 15 7
700,000	50	11 Dec.	7½	Grand Junction, 10 p.c. max.	113–118	..	3 3 6
295,000	Stck.	26 Mar.	4	Do. 4 p. c. Deb. Stk.	148–153*	..	2 12 4
708,000	Stck.	12 Feb.	12	Kent	340–345	..	3 9 7
160,000	,,	,,	7	Do. New, 7 p. c. max.	212–217	..	3 4 6
1,043,800	100	30 Dec.	9½	Lambeth, 10 p. c. max.	273–278	..	3 8 4
406,200	100	,,	7½	Do. 7½ p. c. max.	222–227	..	3 6 1
350,000	Stck.	26 Mar.	4	Do. 4 p. c. Deb. Stk.	147–150*	–1	2 13 4
500,000	100	12 Feb.	13	New River, New Shares	420–425	..	3 1 1
1,000,000	Stck.	29 Jan.	4	Do. 4 p. c. Deb. Stk.	152–155	..	2 11 7
902,300	Stck.	30 Dec.	6	S'thwk & V'xhall, Ordinary	157–162	..	3 14 1
126,500	100	,,	6	Do. Do. 7½ p. c. Max.	150–155	..	3 17 5
489,200	Stck.	,,	5	Do. Do. 5 p. c. Pref.	175–180	..	2 15 7
1,019,585	,,	30 Sept.	4	Do. 4 p. c. A Deb. Stk.	147–150	..	2 13 4
1,155,066	Stck.	11 Dec.	10	West Middlesex	310–315	..	3 3 6
200,000	,,	,,	4½	Do. 4½ p. c. Deb. Stk.	163–168	..	2 13 7

*Ex div.

reported to be open nearly as far as Riga. The prices quoted are: Main, 6s. 6d. per ton f.o.b. Glasgow; ell, 7s.; and splint, 7s. to 7s. 3d. The shipments for the week amounted to 133,166 tons—an increase upon the preceding week of 13,042 tons, and upon the corresponding week of last year of 5251 tons. For the year to date, the total shipments have amounted to 1,409,934 tons—an increase over the corresponding period of last year of 79,537 tons.

Reductions in Price.—At the last few meetings of the Audley District Council, discussions have taken place on the question of reducing the price of gas; and it has now been decided to lower it, from the June quarter, by 3d. per 1000 cubic feet, and to abolish the meter-rents. The Melksham Gas Company, Limited, will from the 1st prox. reduce the price of their gas 2d. per 1000 cubic feet. The Sunbury Gas Company have decided that, where gas-stoves are used, the price of their gas shall be 4s. 3d. instead of 4s. 9d. per 1000 cubic feet.

The New American Tariff.—According to the recently published text of the New American Tariff Bill, all articles composed of earthen or mineral substances not specially provided for, if not decorated, are to bear a duty of 35 per cent.; if decorated, 45 per cent. (against 30 per cent. *ad valorem*). Gas-retorts, $3 each; lava tips or burners, 10c. per gross and 15 per cent. *ad valorem;* carbons for electric lighting and filter tubes, 50 per cent. (against 20 per cent. for gas-retorts), porous pots for electric batteries without metallic connections 20 per cent.

Oldbury Gas Undertaking.—The statement of accounts in connection with the gas undertaking of the Oldbury District Council for the year ending Dec. 31, 1896, has just been issued by the Manager and Secretary (Mr. A. Cooke). It shows that the total amount authorized to be borrowed is £79,199, and that the sum raised and expended up to the end of 1895 was £77,034. There was spent during the past year on new meters and service-pipes £807; making a total of £77,841, and leaving a balance of £1358 on the capital account. The cost of the manufacture of gas was £6124; of its distribution, £293; and the total expenditure was £7752. The total income amounted to £12,720, including the following items: Sale of gas, £10,284; coke and breeze, £1790; tar, £435; ammoniacal liquor, £93; and sundry residuals, £19. A sum of £51 was allowed in discount, which left the net amount received for residual products £2286. The sale of gas-fittings realized £109, and discounts on purchases amounted to £40. There was a gross profit of £4968 on the year's working. Added to this there was a dividend on Consols of £126, and £9 interest allowed by bankers, which brought the total up to £5103. A sum of £2542 was required to pay interest on mortgages; the repayment of loans would take £1136; and £650 was needed to acquire mining rights, to ensure the safety of the gas-works. The net profit was £775, less £429 for regenerative furnaces not yet used. Notwithstanding these extraordinary outlays, the net profit will be more than £300. A loan involving the payment of £300 per annum has been discharged; so that in the current year, with the same volume of business, there is every prospect that the profits will exceed £1000.

Water-Works Improvements at Ryde.—The Ryde Town Council have decided to lay a duplicate water-main from their reservoirs at Ashey, at a cost of £4620.

New Joint-Stock Companies.—The Imperial Continental Water-Works, Limited, is the title of a Company formed with a capital of £200,000, in £10 shares, to supply any districts, cities, or towns with water, and for such purposes to sink wells or shafts, construct reservoirs and water-works, lay down main and other pipes, and do all things necessary for obtaining, storing, and distributing water or otherwise, and generally to carry on the business of a water-works company, whether in the United Kingdom or in any of its colonies or dependencies, or in any part of the world; and, further, to construct and maintain electric light and power, irrigation, and sewage and drainage works, &c. The South London Electric Supply Corporation, Limited, has been incorporated with a capital of £325,000, in £5 shares, to undertake the supply of electricity for lighting and other purposes in the parish of Lambeth, under the powers of a Provisional Order granted to the Vestry of the parish, and transferred to the Company with the sanction of the Board of Trade.

The Use of Unpurified Gas for Motive Power.—A correspondent sends the following: "A question of much importance to gas companies has been incidentally raised by one of the Medical Officers of Health in South Staffordshire, in a report upon the rapidly increasing use of gas-engines. He has nothing to say in regard to these motors except in commendation of them as a great improvement, from a health point of view, on the old-fashioned steam-engines. It appears, however, that not a few of the Black Country manufacturers who use gas-engines are, from motives of economy, making their own gas; and as it is used only as a motive power, they do not put themselves to the trouble or the expense of purifying it. The result is the creation of a public nuisance of a very serious kind. In one town, numbers of houses have been untenanted on account of the stench arising from this crude gas. As regards the effect of this upon the public health, the matter may be left to the sanitary authorities. What is of more importance is the manifest unfairness to gas companies of this free and unrestricted manufacture of gas for private consumption. The companies are prepared to supply gas for motive power at as cheap a rate as is consistent with prudent business management; but they are bound by parliamentary restrictions not to supply for any purpose gas that is not rendered as far as practicable free from sulphur. These restrictions are made in the interests of the public health; and if they are important in the case of gas companies, they are equally so in that of private producers of gas for their own consumption. The lock-making town of Willenhall, in South Staffordshire, has 50 gas-engines at work. The great majority of these are supplied by the local Gas Company; but about half-a-dozen of them are propelled by unpurified gas made by individuals for their own consumption. The result is a public nuisance which is locally described as 'intolerable.' What would happen if all the gas-engine owners made their own gas, and used it in this crude state? and there is apparently nothing to prevent it. The result would be that the atmosphere would be poisoned, and a manifest injustice would be inflicted on the gas companies of the district."

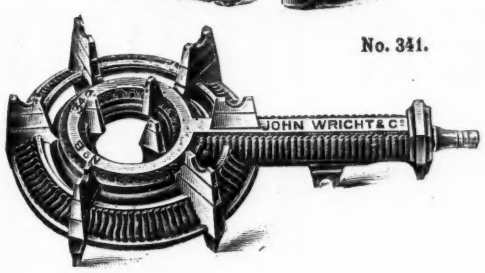
WRIGHT'S
RAPID GAS-GRILLERS & BOILING-STOVES

No. B 628.

SUITABLE FOR USE WITH
PREPAYMENT METERS.

This Broiler is made entirely of **Cast Iron,** and is fitted with a most powerful Burner. The Waste Heat is utilized for boiling. It will cook two Chops and boil a Kettle **at the same time.** Connections may be readily removed from left to right, or *vice versâ.*

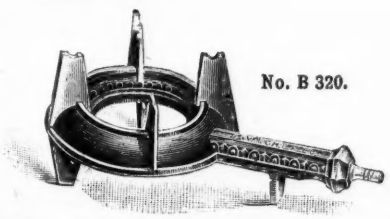
No.	Outside Dimensions. Width.	Depth.	Height.	PRICE complete with Pan and Grid.
B 628	12	8½	6½	6/6



No. 341.

This Stove is a modification of our celebrated "Concentric" Boiling-Stoves (Nos. 321, 322, and 323), which are universally admitted to be the best and most powerful Gas Boiling-Stoves, for their size, ever made. It is cast all in one piece, burns with a perfect flame, is strong, and cannot possibly get out of order, and is specially made to carry vessels of any size, either large or small.

No. **B 341**, 5½ inches diameter **1/9**
No. **B 342**, 7 ,, ,, ... **2/6**
No. **B 343**, 9 ,, ,, ... **3/6**



No. B 320.

A Cheap, Strong Stove, cast in one piece, and plain, so that it can be easily cleaned. This burner has been very largely adopted by The Gaslight and Coke Company, London, and many other principal London and Provincial Gas Companies.

No. **B 320**, 6 inches diameter **1/6**

JOHN WRIGHT & Co., Ltd., BIRMINGHAM & LONDON.

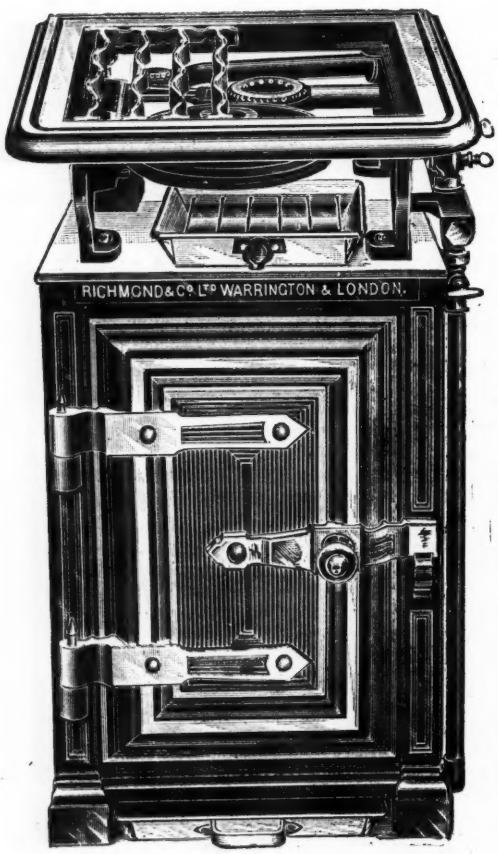
The New Water Reservoir for Ledbury.—Mr. R. E. W. Berrington, Water Engineer of Wolverhampton, who was consulted by the Ledbury District Council regarding an improved supply of water for the town, has reported upon the proposed new reservoir to which reference was made in the first issue of the "JOURNAL" this year. It was then stated that one of the members of the Council (Mr. Biddulph) had offered a quarry in which to construct a reservoir, on a lease of 99 years, at the nominal rent of 1s. per annum, together with permission to take out of the quarry the stone required for the work. The Engineer states that the site, with the stone, is a handsome gift. It will not be necessary to excavate deeper than 6 feet; and consequently his original estimate of £3500 for the reservoir will be sufficient. The Council have decided to apply for a loan of £5000; the extra £1500 being for an extension of the supply to Newtown.

Brynmawr and Blaina Gas Company.—The annual meeting of this Company was held last Friday. The Chairman (Mr. J. Phillips, J.P.) presented the statement of accounts to the shareholders with considerable satisfaction. The scheme of reconstruction recommended by the Company's Engineer and Secretary (Mr. T. Acland), and decided upon in 1893, was vigorously proceeded with during the past year. A new purifying-house and revivifying-shed was partially built, and upwards of 1½ miles of new mains were laid. Among other work to be carried out during the present year, one of the gasholders is to be renewed and telescoped, and its tank repaired and deepened. The result of the year's work has been highly gratifying to the Directors; and it not only allowed the payment of the full dividend of 10 per cent., free of income-tax, but also enabled them to reduce the price of gas 6d. per 1000 cubic feet from the 1st of January last. This they hope will tend to increase the consumption. The usual votes of thanks were accorded to the Chairman and to Mr. Acland.

Sales of Shares.—Last Tuesday, Messrs. Branch and Leete, sold by auction, in accordance with the announcement which appeared in our advertisement columns, £4000 of ordinary "C" (7 per cent.) stock of the Chester United Gas Company, or so much of the amount as would be sufficient to realize the balance of £50,000 additional capital authorized to be raised under the powers of the Company's Act of 1880. The stock was offered in lots of the nominal amount of £100 each; and 39 were sold, realizing in all £6396—making an average of £164 per lot. At the offices of the Hartlepool Gas and Water Company last Thursday, Mr. J. Hunter offered for sale 500 shares of £10 each; being part of the gas capital authorized to be issued by the Company's Act of 1878. An average of £19 0s. 9d. per share was obtained; the highest price being £19 12s. 6d., and the lowest £16 15s. Twenty-two £25 fully-paid shares in the Farnham Gas Company recently realized £59 each for two and £61 each for the remainder; and eight £20 fully-paid shares in the Farnham Water Company changed hands at an average of £44 each. At a sale last Friday, the "B" and "C" stock of the Tunbridge Wells Gas Company realized a record price. The first lot of £50 consolidated "B" stock, paying 9 per cent., fetched £107; a second lot going at the same price. Six lots of "C" stock of the Company were knocked down at £204 per £100 of stock.

East Stonehouse Water Supply.—An inquiry was held at East Stonehouse last Wednesday, by Colonel J. T. Marsh, Local Government Board Inspector, respecting an application by the Urban District Council, for a Provisional Order to partially repeal and amend the East Stonehouse Water Act, 1893, so as to provide for the abandonment of part of the agreement for the supply of water by the Corporation of Plymouth to the Council, and substitute other provisions, as well as to empower the Council to borrow £2300 and carry out works pursuant to such provisions. It was explained by the Clerk to the Council (Mr. R. R. Rodd, jun.) that twelve months ago the Council applied for permission to borrow £4809 for works and water supply, including the laying of a main from the Hartley reservoir of the Plymouth Corporation to the Council's reservoir. Subsequently, at the suggestion of the Local Government Board, negotiations were entered into with the Company, who agreed to lay a 15-inch main to the junction of the two districts. On their part, the Council undertook to pay the Corporation, in addition to the rental stipulated by the Act of 1893, interest at the rate of 5 per cent. per annum on a portion of the cost of the new main, and a rental of £200 a year for thirty years, and afterwards £150 a year in perpetuity. These conditions had been embodied in an agreement between the two authorities, which it was now desired to incorporate in a Provisional Order. The Council would be saved the expense of laying a main to Hartley; but they still required £1000 to lay a main from the boundary of Plymouth into the town, and also the sum of £1300, which was included in the original application, to lay mains in the town. There was no opposition.

Newhaven and Seaford Water Bill.—A public meeting, convened by the Urban District Council, was held at Newhaven last Thursday week, to take into consideration and determine upon the expediency of consenting to the opposition by the Council to the Newhaven and Seaford Water Bill, which seeks to incorporate the Water Company and confer additional powers upon them. The opposition had arisen from the refusal of the Company to insert a purchase clause in their Bill. Mr. J. Peters moved a resolution in favour of the opposition being proceeded with. Mr. S. Sargeant seconded the motion, and said the following figures would show how the purchase question stood: First, as to the cost of acquiring the Company's works, the last balance-sheet showed their share capital was £17,000; and their loan capital, £3000—making a total of £20,000. The capital expenditure was £19,921. The profit and loss account showed a balance of £1366 available for dividends. He was advised that the present value of the undertaking was about £28,000; but, calculated at the present value of the shares, and adding £2000 for the cost of the Act, it might be put at £30,000. If the Council purchased at this sum, they would be allowed to borrow the money; and if the Company could borrow at 3 per cent., so could the Council, and such a loan could be so repaid as to extend over forty years. This would involve an annual payment of £1297; and the net profits of the Company amounted to £1090—leaving £207 to be raised from the rates. A 2½d. rate, if raised for a period of forty years, would provide the purchase-money. The motion was carried unanimously. On the same day, a meeting of the owners and ratepayers of Seaford consented to the opposition of the District Council to the Bill.



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WARRINGTON, STRATFORD, & LONDON.

1897 New Pattern

KING-OF-THE-SLOTS

"K-O-S."

FITTED WITH LOOSE BURNERS FOR CLEANING, &c., AND WHITE ENAMELLED CROWN PLATE.

No. 128 - - - - - 65/-

Wrotham Water Supply.—Last Wednesday, Mr. W. A. Ducat held an inquiry on behalf of the Local Government Board, relative to the application of the Wrotham Urban District Council to be invested with the powers and duties conferred upon rural authorities by the Public Health Act. Mr. G. F. Carnell (Clerk to the Council) said that great difficulty had been experienced in getting owners to provide a water supply to their houses; and the Council now sought to be armed with the powers of the Act in order that they might overcome the difficulty. They had an opportunity of getting a supply of good water for about £1500. Evidence was given as to the present condition of the water supply.

San Paulo Gas Company. Limited.—At the meeting of this Company in March last year, reference was made to the expected call for tenders for the lighting of San Paulo by gas from the date of the expiration of the Company's present concession. In a circular which the Directors have addressed to the shareholders, they mention that advertisements have for some time past appeared in the Press, both in Great Britain and on the Continent, inviting tenders for the new service. In consequence, it was advisable for the Company's Manager to pay a brief visit to London, in order to confer with the Directors as to the details of the tender to be sent in. Owing to his absence from his post, it has not been possible for him to prepare the accounts with the usual expedition; and, in the circumstances, the annual meeting will not take place until the middle of May. The accounts already to hand will warrant the Directors in recommending a final dividend for the six months ending Dec. 31 last of 5 per cent., making, with the interim payment, 10 per cent. for the year.

Poisoning by Coal Gas.—At the Charing Cross Hospital, on Monday last week, Mr. Troutbeck held an inquest on the body of Mr. Mark Knights, aged 53 years, chief reporter on the "Eastern Daily Press" and "Norfolk News," lately residing at Norwich. Deceased came to London on the previous Saturday to report the proceedings at the dinner given to East Anglicans at the Holborn Restaurant; and he was staying at the Cheshire Cheese Hotel, in Surrey Street. Mrs. West, the landlady of the hotel, said she last saw the deceased early on Sunday morning; and he then ordered his breakfast for nine o'clock. Witness went to his room at that time, and, getting no answer, opened the door, and found him lying on the floor dead. There was a strong smell of gas in the room; and, on examination, witness found that one burner out of the three in the chandelier was fully on, but not alight. The landlord of the hotel stated that when he visited the room he found the chandelier drawn right down. Dr. Hammert, of Southampton Street, said death was due to suffocation and poisoning from carbonic oxide. The verdict was "Death from misadventure."

Dorking Gas Company.—The report presented at the half-yearly meeting of this Company last Tuesday showed that, after providing for the interest on the debenture stock, there was an available balance of £2517. The Directors recommended the payment of dividends at the rate of 10 per cent. on the "A" and "B" shares, and 7 per cent. on the "C" shares; also 3s. per share on the "A" and 2s. per share on the "B" shares on account of arrears of dividend. After paying these, there will be a balance of £1620 to be carried forward to the next account, as against £1546 in the previous half year. The reduction in the price of gas in June last resulted in the satisfactory increase in the sale of gas of 6·87 per cent., or 986,000 cubic feet. The price of 3s. 7d. per 1000 cubic feet net, the report said, compared very favourably with towns of the same size in the neighbourhood; and the Directors hoped to make a further reduction from the taking of the meters at the end of June. Forty gas-stoves had been fixed during the six months. The incandescent system of gas lighting, it was also announced, was making great progress in the district, and had led to a considerable number of additional consumers. From the statement of accounts, it appeared that the total expenditure on revenue account was £2304; and the profit for the half year was £1098. The report was adopted; and votes of thanks were passed to the Chairman (Mr. John Young) and Directors, the Manager (Mr. S. Carpenter), and the Secretary (Mr. W. J. Down).

Goole Gas Accounts.—The accounts of the Gas and Water Committee of the Goole District Council for the past year show a satisfactory state of affairs. It appears that in the three years during which the Council have held the concern, they have reduced the price of gas 3d. per 1000 cubic feet. They have handed over £750 in relief of rates; and beyond this on the three years' working, they have more than £3000 clear profit. It is suggested that the price of gas should be reduced a further 3d. per 1000 cubic feet, and £500 handed over to the relief of the rates, after which the department will have a working capital of £2000.

Sheppey Gas Company.—The annual general meeting of this Company was held on the 17th inst.—Mr. C. B. Shrubsole in the chair. The report, noticed in the "Journal" for the 16th inst., having been read by the Secretary (Mr. A. W. Marks), its adoption was moved by the Chairman. In doing so, he remarked that for some time the consumption of gas remained stationary, or nearly so; but in 1895 there was an increase of 3½ million cubic feet of gas made and consumed, and in 1896 there had been a further increase of upwards of 3½ millions—making an increase of 7 millions in two years. This was no doubt partly due to the advantages of gas becoming more widely understood, and the use of it for heating and cooking purposes being better appreciated. This was shown by the increased quantity of gas consumed during the daytime. The Directors had found it difficult in the winter evenings to keep up the supply of gas; and hence the necessity of increased storage at the works. The 80-feet gasholder had been telescoped; and the Directors considered the way in which the work had been carried out reflected great credit upon the Engineer (Mr. W. T. Carpenter). The Directors were satisfied with the year's working, and considered that the prospects of the Company indicated prosperity. Mr. D. Wills seconded the motion; and it was carried unanimously. The full statutory dividends were then declared; and the thanks of the meeting were accorded to Mr. Marks and Mr. Carpenter, also to the Chairman and Directors, for their services to the Company.

Messrs. Easton, Anderson, and Goolden, Limited, having disposed of their premises in Whitehall Place, their London address is now Broad Sanctuary Chambers.

The Devizes Town Council have accepted an offer of Messrs. E. Cockey and Sons, Limited, for the fixing of retort-benches at their gas-works, at a cost of about £360.

The Directors of the Shanghai Water-Works Company, Limited, have declared a final dividend of 25s. per share in respect of the working for the year 1896; an interim dividend of 15s. per share having been paid in July last.

The new gasholder for the Cowes Gas Company, to which reference was made in the "Journal" last week, is to be erected by Messrs. E. Cockey and Sons, Limited, in accordance with designs prepared by Mr. Corbet Woodall, M.Inst.C.E. They have also been entrusted with an order for increased storage at the East Cowes Gas-Works.

Exhibitions of gas appliances are being held at Leeds by Messrs. Fletcher, Russell, and Co., with Miss E. E. Golding as cookery demonstrator; and at Bradford, by Messrs. C. Wilson and Sons, with lectures by Miss Knott. Messrs. John Wright and Co. have recently been exhibiting at Hanley, in conjunction with the British Gaslight Company.

The Newport (Mon.) Gas Company are renewing part of their retort-house plant, according to the designs of their Engineer (Mr. T. Canning, Assoc.M.Inst.C.E.). The settings are to be on the Winstanley regenerative system; and the contract has been entrusted to Messrs. R. and J. Dempster, Limited, of Manchester. The Bo'ness Gas Company, N.B., have placed in the hands of the same firm the order for a new telescopic gasholder and cast-iron tank, at a cost approaching £6000. The plans and specifications for the work were prepared by Mr. R. Mitchell, of Edinburgh, the Engineer of the Company.

GWYNNE & BEALE'S
PATENT GAS EXHAUSTERS AND ENGINES.

Telegrams: "GWYNNEGRAM, LONDON." Telephone No. 65,095.

GWYNNE & CO.,

HYDRAULIC AND GAS ENGINEERS,

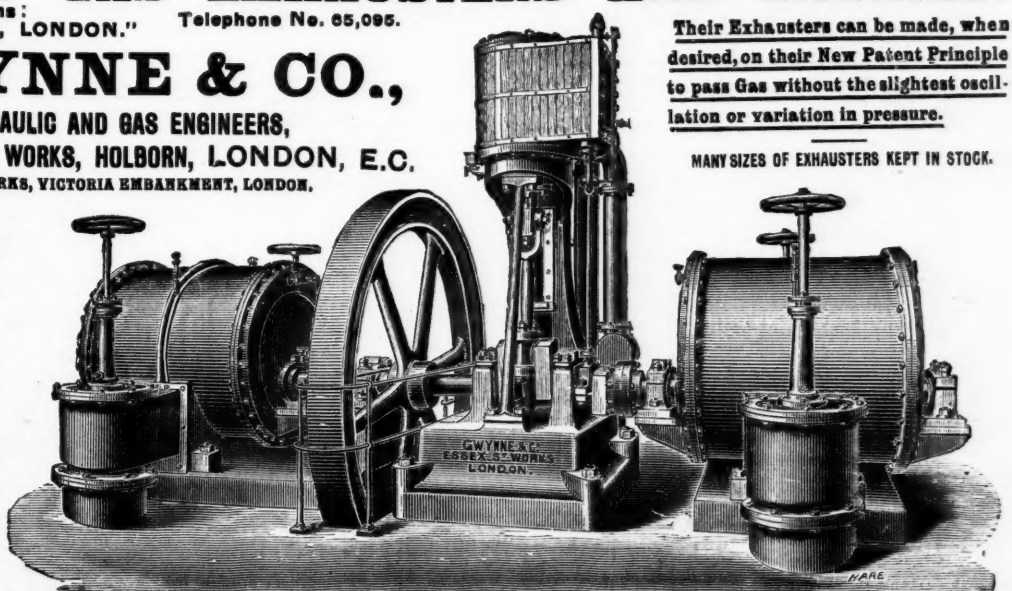
BROOKE STREET WORKS, HOLBORN, LONDON, E.C.

Late ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON.

They have completed Exhausters to the extent of 33,000,000 cubic feet passed per hour, which are giving unqualified satisfaction in work.

Makers of GAS-VALVES, HYDRAULIC REGULATORS, VACUUM GOVERNORS, PATENT RETORT-LIDS, STEAM-PUMPS for Tar, Liquor, or Water; CENTRIFUGAL PUMPS and PUMPING ENGINES, specially adapted for Water-Works, raising Sewage, &c.

Also GIRARD and other TURBINES, HIGH SPEED ENGINES, DYNAMOS, &c., &c., for ELECTRIC LIGHTING.



Their Exhausters can be made, when desired, on their New Patent Principle to pass Gas without the slightest oscillation or variation in pressure.

MANY SIZES OF EXHAUSTERS KEPT IN STOCK.

Exhausting Machinery at Fulham and Bromley Gas-Works, London—each set passing 400,000 cub. ft. per hour drawing 14 miles distant from Beckton.

Catalogues and Testimonials sent on application.

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Orders for Alterations in, or Stoppages of PERMANENT ADVERTISEMENTS, should be received not later than the FIRST POST on SATURDAY.

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O'NEILL'S Oxide has a larger annual sale in the United Kingdom than all other Oxides combined. Purity and uniformity of quality guaranteed. Pamphlet, "How to Purchase Bog Ore," to be obtained on application.
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Palmerston Buildings, Old Broad Street, London, E.C.

ANDREW STEPHENSON, AGENT. All communications *re* Oxide to be addressed to Palmerston Buildings.

WINKELMANN'S "VOLCANIC" CEMENT. Fire Resistance up to 4500° Fahr. in use in most Continental Gas-Works, and in more than 800 British Gas-Works.
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Telegrams: "Volcanism, London."

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BROTHERTON AND Co., Ammonia Distillers.
Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

GAS TAR wanted.
BROTHERTON AND Co., Tar Distillers.
Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

SPENT OXIDE wanted.
BROTHERTON AND Co., Chemical Manufacturers.
Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

SULPHURIC ACID for Sale.
BROTHERTON AND Co., Chemical Manufacturers.
Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

BROTHERTON & CO.
Offices: Commercial Buildings, LEEDS.
Correspondence invited.

JOHN RILEY & SONS, Chemical Manufacturers, Hapton, near Accrington, are MAKERS of SULPHURIC ACID, from Brimstone, for Sulphate of Ammonia making. Highest percentage of Sulphate of Ammonia obtained from the use of this Vitriol. References given to Gas Companies.

HYDRATED OXIDE OF IRON.

PREPARED from pure Iron.
Two or three times as rich as Bog Ore.
Strong action on Sulphuretted Hydrogen.
To be used alone, but will increase activity of other Oxides.
Less than half the price of Bog Ore.
Can be lent on hire.
Write for tabulated results.
READ HOLLIDAY AND SONS, LIMITED, HUDDERSFIELD.

WANTED, a Situation as Gas-Fitter. Experienced in Stove Fixing and Repairing.
Address No. 2820, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a Situation as Inspector (good Fitter, and willing to be generally useful to Manager), or to take charge of Small Works.
Address No. 2823, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

ADVERTISER is open to represent first-class Firm. Established connection with Gas Engineers, and thorough knowledge of all Hydrocarbons used in Water Gas or Carburetting.
Address No. 2824, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

RE-ENGAGEMENT wanted by a very successful GAS AND WATER ENGINEER and MANAGER. Recently resigned good position. Well known in the Profession. Desires to travel for a good Firm. Correspondence invited.
Address No. 2816, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a Situation as Gas-Fitter. Well up in Iron and Compo. work, Fixing of Stoves, Cookers, Regulators, Meters, Main and Service Laying, and General Routine of Gas-Works. Good References.
Address No. 2822, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

MALVERN URBAN DISTRICT COUNCIL.
(GAS DEPARTMENT).

FITTER.

WANTED, immediately, a good reliable WORKMAN as above. One thoroughly accustomed to all Plant in Gas-Works, and who can take the lead in alterations. Permanent Employment for a really good Man.
Apply, giving References and Wages required, to
H. P. MAYBURY,
Gas Engineer and Manager.
Malvern.

J. & J. BRADDOCK, Globe Meter Works, Oldham.
First-Class Award, Melbourne Exhibition, 1889, for WET AND DRY GAS-METERS, STATION METERS, AND GOVERNORS, PRESSURE-GAUGES, STREET LAMPS AND PILLARS, &c.
Telegraphic Address: "Braddock Oldham."

SULPHURIC ACID.

JOHN NICHOLSON & SONS, Limited, Chemical Works, Leeds, specially produce this ACID from SULPHUR, for making SULPHATE OF AMMONIA of high quality and *good* colour. Delivery in our own Railway Tank-Wagons or Carboys. Highest references and all particulars supplied on application.

PORTER & CO., Gowts Bridge Works, LINCOLN, Engineers, Ironfounders, and Contractors for the erection of Gas-Works for Towns, Villages, Mansions, Manufactories, Collieries, and Isolated Buildings at home and abroad. Manufacturers of Retorts and Fittings, Condensers, Scrubbers, Purifiers, Valves, &c.; also of Girders, Wrought and Cast Iron Tanks, Iron Roofs, &c.
Telegraphic Address: "PORTER LINCOLN."
[For Illustrated Advertisement, see March 2, p. 498.]

SADLER & Co., Ld., Middlesbrough; ULVERSTON (BARROW); PORTSMOUTH; CARLTON (N.E.R.); and STOCKTON. Tar and Petroleum Distillers. Benzol and Petroleum Spirit, 700 and other Gravities specially prepared for Carburetting. SOLAR OIL for Gas Making, Kerosene, &c.
Correspondence invited.
Telegraphic Address: "Sadler, Middlesbrough."

SPECIAL PAINT FOR GAS-WORKS.

JOHN E. WILLIAMS AND CO.,
VICTORIA PAINT WORKS.
MANCHESTER.
Telegrams: "ENAMEL." National Telephone 1759.

GAS EXHAUSTERS.

OUR SPECIALITY is High-Class Gas EXHAUSTING MACHINERY. Various Sizes in Stock or Progress. Write for Estimates.
SELLERS, PICKERING, AND Co., Gas Engineers and Contractors, Ravensthorpe, YORKS.

SULPHATE OF AMMONIA SATURATORS.

WALTER THOMASON and SONS, Chemical Plumbers, &c., and Makers of Lead Saturators, &c., 21, WESTON STREET, BOLTON. Repairs of every description.
Please write for Estimate before ordering elsewhere.

WANTED, a steady, industrious Man (good Stoker and used to Exhauster and Engine), for small Works.
Address, stating Age and Wages required, the MANAGER, Gas-Works, SOWERBY BRIDGE.

REPRESENTATIVE, to call on Gas Companies in London and the South of England and Wales for the SALE OF GAS-METERS and GAS-APPARATUS, wanted by an old-established Firm.
Apply, by letter, with References, to No. 2821, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a General Foreman at large Gas-Works (Midlands). Trained Mechanic, used to Gas Plant Preferred.
Apply, by letter, with References, and state Wages required, to No. 2826, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, in a Provincial Gas-Works, a JUNIOR ASSISTANT, well up in Chemistry and Photometry. One with Drawing Office experience preferred.
Reply, by letter, stating Age, Salary expected, &c., to No. 2825, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a Working Manager for small Gas-Works making about 6 million cubic feet per annum.
Apply, stating Salary required, with Testimonials, by the 10th of April next.
Particulars of Duties, &c., on application to
J. G. LANGHAM,
Secretary.
Public Hall Chambers,
Uckfield, March 27, 1897.

GAS-WORKS WORKING MANAGER.

WANTED, in a small Gas-Works supplying an increasing demand for Gas, a WORKING MANAGER having experience, and fully qualified in all the recently improved Furnaces, Retorts, and other Apparatus, including Siemens' Regenerative and other Furnaces. Must be a qualified Gas-Fitter, able to give all requisite attention to Meters, Gas-Stoves, &c.
Reply, by letter only, to F9, *Daily Post*, BIRMINGHAM, stating Age and Wages required. Unexceptional References must be given.

WANTED, to purchase Gas Carbon delivered at nearest Station to Gas-Works, in quantities of not less than 4 tons.
Address, stating Price per ton and quantity, No. 2772, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

GAS PURIFICATION.

OXIDE OF IRON BOG ORE.

BALE & CO.'S Oxide of uniform quality, SPECIAL FIRE CEMENT, OXIDE PAINTS, OILS, SULPHURIC ACID, &c.
120 and 121, NEWGATE STREET, LONDON, E.C.
Telegrams: "BOGORE, LONDON."

SULPHATE OF AMMONIA SATURATORS.

JOSEPH TAYLOR & CO., Chemical Plumbers, &c., and Makers of every description of Solid Plate Lead and Timber Cased Saturators, &c. CENTRAL PLUMBING WORKS, TOWN HALL SQUARE, BOLTON. Special Attention to Repairs.
Before placing Orders, please write for Estimate.

BLUE PRINTS of all kinds in any weather. Drawings and Tracings promptly executed.
J. L. FEATHERSTONE, 21, Old Queen Street, WESTMINSTER, S.W.

PATENTS FOR INVENTIONS.

J. C. CHAPMAN, M.I.M.E. and Fel. Chartered Inst. Patent Agents. ADVICE ON ALL MATTERS CONNECTED WITH ABOVE. Information and Handbook on application.
70, CHANCERY LANE, LONDON, W.C.

CANNEL, COAL, ETC.

JOHN ROMANS & SON, EDINBURGH, Gas Engineers, supply all the most approved SCOTTISH CANNELS; also FIRE-CLAY GOODS, CAST-IRON PIPES, and other APPARATUS for GAS and WATER WORKS.
Prices, &c., will be forwarded on application to No. 80, ST. ANDREW SQUARE, EDINBURGH, } SCOTLAND.
NEWTON GRANGE, NEWBATTLE, DALKEITH, }

ECONOMY IN PURIFICATION.

INCREASE the Efficiency of your PURIFIERS by adopting CRIPPS'S PATENT BYE-PASS VALVE in the lower Tiers of Sieves. Practical Experience proves their Economy. Engineers are repeating orders after thorough trial.
References and Particulars can be obtained from the Makers—
C. & W. WALKER, Midland Iron-Works, Donnington, near Newport, SALOP.
And J. EVERY & SON, Phœnix Iron-Works, LEWES.

TO METER MAKERS.

THE Corporation of Halifax are prepared to receive APPLICATIONS for the post of FOREMAN in their Meter-Shop. Applicants must be thoroughly competent to repair and test Wet and Dry Gas-Meters in accordance with the Sale of Gas Act. None but steady, experienced Men need apply.
Letters must be addressed to the undersigned not later than the 5th of April, 1897, in the Applicant's own handwriting, stating fully the Training, Experience, present Position and Wages required, accompanied with *copies* of three Testimonials as to character and ability.
Canvassing directly or indirectly is not allowed.
THOS. HOLGATE,
Gas Engineer.
March 25, 1897.

GAS TAR and Ammoniacal Liquor Wanted.
Apply to JOSIAH HARDMAN, Milton, STAFFS.

THE Broadstairs Gas Company have FOR SALE a second-hand GASHOLDER, 24 feet diameter by 16 feet deep.
Price and Particulars may be had of the MANAGER.

GAS PLANT for Sale—I can always offer NEW and SECOND-HAND GAS APPARATUS, including Retorts and Fittings, Condensers, Exhausters, Scrubbers, Washers, Purifiers, Gasholders, Tanks, Valves, Connections, &c. Also COMPLETE WORKS equal to 7000, 20,000, 60,000 cubic feet per diem. **Inquire and compare Prices and Particulars before ordering elsewhere.**
J. F. BLAKELEY, Gas Engineer, Ravensthorpe, YORKS.

FOR SALE—Young's Washer-Scrubber with 8-inch Valves and Connections, in capital order. May be seen working.
STATION METER (W. & B. Cowan's make); 3½-inch Valves and Connections.
Also a Small PORTABLE VERTICAL BOILER, equal to new.
Apply for Particulars to WM. B. M'LUSKY, Gas-Works, KELSO, N.B.

FOR SALE, cheap—
One TELESCOPIC GASHOLDER, 32 ft. diameter, with two lifts 14 ft. deep each; Capacity, 23,500 cubic feet, with Wrought-Iron Tank complete.
One CAST-IRON SCRUBBER, 38 ft. 6 in. by 6 ft. diameter.
Two PURIFIERS, 8 feet square, complete, with 6-inch Bye-Pass Valves and Connections.
EXHAUSTERS, 5000 to 60,000 cubic feet per hour.
We would undertake to re-erect any of the above, if desired.
Photos, Particulars, and Prices of above on application to SAML. WHILE AND SONS, 60, Queen Victoria Street, LONDON, E.C.

WARRINGTON CORPORATION.
(GAS DEPARTMENT.)

REMOVAL OF WORKS.

FOR SALE—18-in. by 14-in. ⌂, and 15- inch and 18-inch Round, MOUTHPIECES, HYDRAULIC MAINS, ASCENSION-PIPES, FURNACE FITTINGS, EXHAUSTERS, TAR-WASHER, 18-inch CENTRE and FOUR-WAY PURIFIER VALVES, 12-inch HYDRAULIC CENTRE-VALVE, METER (12-inch Connections), ENGINES, PUMPS, &c.
Apply for Particulars to MR. W. S. Haddock, Engineer.

FREDK. TAYLOR, Secretary.

Gas-Works, Warrington.

STRETFORD GAS COMPANY.

FOR SALE—
Two HYDRAULIC MAINS, 53 ft. 6 in. long each, by 20 in. wide by 22 in. deep.
Fourteen Cast HYDRAULIC MAIN STANDS.
Seven Cast BENCH GIRDERS.
Fourteen Cast BUCKSTAYS.
And a number of ⌂ RETORT MOUTHPIECES, 19½ in. by 15½ in., 5-inch and 5 in. by 4 in. ASCENSION-PIPES and 4-inch DIP-PIPES.
Apply for Particulars to Mr. H. Kendrick, Engineer.
Offers to be addressed to the Chairman of the Board of Directors.

BENJAMIN HAYNES, Secretary.

Gas-Works, Stretford, near Manchester.

RAMSGATE CORPORATION.
(GAS DEPARTMENT.)

TENDERS FOR TAR.

THE Gas and Water Committee invite TENDERS for the surplus TAR (140,000 Gallons or thereabouts), to be made between the 1st of April, 1897, and the 31st of March, 1898.
Tenders to be returned on or before Saturday, April 3, addressed to the Chairman of the Gas and Water Committee, Hardres Street, Ramsgate, and endorsed "Tender for Tar."
The Committee do not bind themselves to accept the highest or any tender.
Full Particulars on application to

WILLIAM A. VALON, Engineer.

MORECAMBE GAS AND LIGHT COMPANY.

TENDERS FOR COAL.

THE Directors of the above Company are prepared to receive TENDERS for the supply of 5000 Tons per Annum of screened GAS COAL, to be delivered on the Gas-Works Siding, Midland Railway, Morecambe, in such quantities as may be required during a period of One, Two, or Three Years.
Tenders, specifying the description of Coal, the Name of the Pit at which it is raised, and the Terms for net monthly payments, are to be sent in on or before Friday, the 2nd of April, 1897, endorsed "Tender for Coal."
The Directors do not bind themselves to accept the lowest or any tender.

WILLIAM DUFF, Secretary and Manager.

Market Street, Morecambe, March 18, 1897.

TUNBRIDGE WELLS GAS COMPANY.

TO COAL FACTORS AND OTHERS.

THE Directors of the Tunbridge Wells Gas Company will be prepared on Tuesday, the 13th day of April next, to receive TENDERS for the supply of 20,000 Tons of good, clean, unscreened GAS COALS, to be delivered free into the Gas Company's Siding on the South-Eastern Railway, at Tunbridge Wells, in accordance with the Terms and Conditions which may be obtained on application.
The tenders to be sent to me by not later than Six o'clock p.m., on Tuesday, the 13th day of April, marked "Tender for Coals."
The lowest or any tender will not necessarily be accepted.

By order,
JOHN READ, Secretary and General Manager.

Gas Company's Office, 44, High Street, Tunbridge Wells, March 24, 1897.

TENDERS are invited for Lighting the City of S. PAULO (BRAZIL) BY GAS, and must be sent under sealed covers, marked "Illuminação a Gaz da Cidade de S. Paulo," to the Secretaria da Agricultura, Commercio, e Obras Publicas (Department of Agriculture, Commerce, and Public Works), S. Paulo, Brazil, or to the Ministerio de Industria, Viação, e Obras Publicas (Ministry of Industry, Roads, and Public Works), Rio de Janeiro, in time to reach either of the said Departments not later than Three o'clock p.m., on the 30th of April, 1897.
Particulars may be had on application, by letter, to the Brazilian Legation, London; or to the Brazilian Consulates in London, Liverpool, or Glasgow, to the care of any one of which tenders may also be addressed, provided they are delivered soon enough to be forwarded for re-delivery to the said Departments by the date and hour above specified.
Plans of the City of S. Paulo may be inspected at the BRAZILIAN CONSULATE, 6, Great Winchester Street, LONDON, E.C.

BOROUGH OF MACCLESFIELD.

TENDERS FOR TAR & AMMONIACAL LIQUOR.

THE Gas Committee are prepared to receive TENDERS for the purchase of the surplus TAR and AMMONIACAL LIQUOR made at their Works during the Twelve Months commencing the 1st day of May next.
Tenders for the Tar or Liquor, separately, to be sent in not later than Saturday, the 10th of April, 1897, addressed to the Chairman of the Gas Committee, Town Hall, Macclesfield, and endorsed "Tender for Tar," &c.
For Conditions apply to Mr. Newbigging, Engineer, Gas-Works, Macclesfield.
The Committee reserve to themselves the right of accepting any tender for the Tar or Liquor separately.
The highest or any tender not necessarily accepted.

W. FREDK. TAYLOR, Town Clerk.

March 9, 1897.

LIVERPOOL UNITED GASLIGHT COMPANY.

TENDERS FOR CANNEL.

THE Directors of the Liverpool United Gaslight Company are prepared to receive TENDERS for the supply of 60,000 Tons of CANNEL, to be delivered at the various Works of the Company during the period of Twelve Months between the 1st of July, 1897, and the 30th of June, 1898.
Tenders will be received for the whole or any portion of the above quantity.
The Directors reserve the right to accept tenders for the whole or any portion of any quantity offered, and do not bind themselves to accept the lowest or any tender.
Full Particulars and printed Forms of Tender can be obtained, on application to the undersigned, at the Gas Office, Duke Street, Liverpool, to whom Tenders (on the printed form only) must be delivered at or before Ten a.m., on Thursday, April 22, endorsed "Tender for Cannel."

By order,
WILLIAM KING, Engineer.

Gas Office, Duke Street, Liverpool, March 25, 1897.

CORPORATION OF LEICESTER.

SEC. 2. CONTRACT 35.		CAST-IRON FLOORING-PLATES AND COLUMNS.
,,	,,	37. ROLLED STEEL JOISTS, &c.
,,	,,	39. SHEDDING.
,,	,,	40. TRAVELLING CRANE.
,,	,,	41. PURIFIERS.
,,	,,	45. CONDENSERS.

THE Gas and Electric Lighting Com- mittee are prepared to receive separate TENDERS for the supply and erection of any of the above required at their Aylestone Road Works.
Drawings may be seen, and Specifications and Forms of Tender obtained, upon application to the Engineer, and on payment in each case of the sum of £5, which amount will be returned upon receipt of a *bonâ-fide* tender.
Tenders, addressed to Alderman Lennard, Chairman, and endorsed "Tender for———," to be delivered at these Offices not later than Eleven o'clock a.m., on Saturday, April 10, 1897.
The Committee do not bind themselves to accept the lowest or any tender.

ALFRED COLSON, M.Inst.C.E., Engineer and Manager.

Offices: Millstone Lane, Leicester, March 24, 1897.

THE Directors of the Boughton Blean Gas and Coke Company, Limited, invite TENDERS for the supply and laying of 876 yards of 3-inch CAST-IRON GAS-MAIN in Boughton Blean Street, near Faversham.
Printed copies of the Specification and Details may be had in exchange for Postal Orders for 2s. 6d. from the undersigned; and sealed tenders, endorsed "Tender for Gas-Main," are to be delivered to him on or before the 12th of April next.
The Directors do not bind themselves to accept the lowest or any tender.

F. W. FULLER, Secretary.

20, West Street, Faversham, March 17, 1897.

SKIPTON GAS COMPANY.

THE Directors of this Company are pre- pared to receive TENDERS for the supply of 3000 or 6000 to 6500 Tons of best screened GAS COAL, to be delivered in such quantities and at such times as may be required during the Twelve Months ending June 30, 1898.
Quotations to specify price free on rails at Skipton, or delivered into the Company's Coal-Sheds alongside the Canal.
Sealed tenders, endorsed "Tender for Coal," to be sent to me not later than April 12 next.
The Directors will not be bound to accept the lowest or any tender.

J. HAIGH, Secretary.

March 26, 1897.

ISSUE OF STOCKS AND SHARES BY AUCTION UNDER PARLIAMENTARY POWERS.

MR. ALFRED RICHARDS undertakes the issuing by Auction of GAS AND WATER SHARES under Parliamentary Powers.
He also holds MONTHLY SALES of GAS AND WATER SHARES at the Auction Mart, Tokenhouse Yard, E.C.
Terms for the issuing of Capital, and also for offering to auction Gas and Water Shares, and all Particulars relating thereto, may be had of Mr. Alfred Richards.
Offices: 18, FINSBURY CIRCUS, E.C.

By Order of the Directors of the

LEA BRIDGE DISTRICT GAS COMPANY.

£6250 FOUR PER CENT. PERPETUAL DEBENTURE STOCK.

MR. ALFRED RICHARDS will Sell the above BY AUCTION at the Mart, London, E.C. on Monday, April 5, at Two o'clock precisely, in lots.
Particulars of the SECRETARY of the Company, 3, JEFFREY'S SQUARE, E.C.; and of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

By Order of the Directors of the

NORTHFLEET AND GREENHITHE GAS COMPANY, LTD.

MR. ALFRED RICHARDS will Sell by AUCTION, at the Mart, London, E.C., on Monday, April 5, at Two o'clock, in lots, 300 £5 fully-paid SHARES in the above Company, ranking for a standard Dividend of 7 per cent., subject to the Sliding-Scale; the last Dividend on similar Shares having been 8½ per cent.
Particulars of the SECRETARY, NORTHFLEET; and of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

By Order of Executors and others.

GAS AND WATER STOCKS AND SHARES IN THE

Brentford Gas Company,
Hornsey Gas Company,
Imperial Continental Gas Association,
Peterborough Gas Company,
Isle of Thanet Gas Company,
Goring and Streatley Gas and Water Company,
Harrow and Stanmore Gas Company,

TO BE SOLD BY AUCTION BY

MR. ALFRED RICHARDS at the Mart, London, E.C., on Monday, April 5, at Two o'clock, in Lots.
Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

INCLINED SYSTEM OF GAS-RETORTS.

Please Note the IMPORTANT JUDGMENT of the Honourable Mr. Justice Romer in this week's "Journal" (pp. 724-25) respecting the VALIDITY OF COZE'S PATENT.

All Inquiries as to Plans, Royalties, &c., to be made to the

AUTOMATIC COAL-GAS RETORT CO., LD., 111, PALACE CHAMBERS, WESTMINSTER, S.W.

SLIGO GASLIGHT AND COKE COMPANY.

ISSUE OF £1000 4½ PER CENT. PREFERENCE STOCK; BEING BALANCE OF £4000 AUTHORIZED.

THE Directors will receive Tenders for the above STOCK on Friday, April 9, in Lots of single Shares of £10 each, which will be allotted to the highest tender; but no tender will be accepted for less than £11 for every £10 Share.

Conditions of Sale and Forms of Tender can be had on application to the undersigned.

C. B. TULLY,
Secretary.

Gas-Works, Sligo,
March 24, 1897.

TO GAS & WATER OFFICIALS.

SPECIAL AND FAVOURABLE TERMS FOR

CYCLES ARE OFFERED.

The very best "UP-TO-DATE" CYCLE at a REASONABLE COST.

"DUNLOP" TYRES, "WESTWOOD" RIMS, "BROOK'S" SADDLE.

Finest Finish and Workmanship. Satisfaction guaranteed. *Catalogue post free.*

MELROSE CYCLE COMPANY, COVENTRY.

E. ASQUITH & CO.,
Hydraulic Engineers,
17, Mather Street, Ancoats, Manchester,
Fit up Plants for
Pressing Anthracene, Naphthalene, &c.
Competent Men sent out to erect same. Estimates given.

Price, Bound in Cloth, 5s. 6d., Post Free.

— FOURTEENTH YEAR —

THE
COMPLETE REPORTS
OF PROCEEDINGS OF THE
ASSOCIATIONS
OF
GAS ENGINEERS & MANAGERS
OF THE UNITED KINGDOM
FOR 1896.

The Thirteen previous Volumes (1883-95) are still on sale, Price 3s. each, Post free.

LONDON:
WALTER KING, 11, Bolt Court, FLEET STREET, E.C.

HOLMSIDE GAS COALS.

PRESENT DAILY PRODUCE OVER 4000 TONS.

LATEST ANALYSIS—By CHARLES PHILLIPS, Gas Examiner to Rotherham Corporation.

Yield of Gas Per Ton . . 11,205 Cubic Feet.
Illuminating Power, 16 7/10 Stand. Sperm. Candl.
Coke (of good & pure quality) 13¾ Cwt. Per Ton.
Sulphur . . . . A little over 1 Per Cent.
Ash . . . . . Under 1 Per Cent.
Tar . . . . . 163 Lbs. (Avoir.) Per Ton.
Ammoniacal Liquor 103 Lbs. (Avoir.) Per Ton.

HOLMSIDE GAS COALS are supplied to the largest Gas Companies in England and on the European Continent; London alone consuming about half the produce.

SOUTH MOOR PELTON GAS COALS.

PRESENT DAILY PRODUCE AVAILABLE 2500 TONS.

RESULTS OF DIFFERENT ANALYSES:—

Yield of Gas Per Ton. . 10,500 Cubic Feet.
Illuminating Power . 17 Stand. Sperm Candl.
Coke (of excellent quality) . 13½ Cwt. Per Ton.
Sulphur . . . . . 1·13 Per Cent.
Ash. . . . . 1·34 Per Cent.
Tar. . . . . 180 Lbs. (Avoir.) Per Ton.
Ammoniacal Liquor 94½ Lbs. (Avoir.) Per Ton.

The HOLMSIDE and SOUTH MOOR COAL-FIELD possesses *a very great quantity of the best Coal;* and, whilst other Coal-Fields are becoming exhausted, this one is only being opened out, so that *the quality* of both the HOLMSIDE COALS, and the SOUTH MOOR COALS *may be relied upon for all practical purposes.*

These Coals may be bought through the Principal Merchants in England, or direct from

MR. MARK ARCHER,
HOLMSIDE AND SOUTH MOOR OFFICES,
NEWCASTLE-UPON-TYNE.

ROBERT MARSHALL,
CANNEL COAL MERCHANT,
97, WELLINGTON STREET, GLASGOW.

Prices and Analysis of all the Scotch Cannels on Application.

THE SILICA FIRE-BRICK
COMPANY,
OUGHTIBRIDGE, near SHEFFIELD,
MANUFACTURE
SILICA BLOCKS,
BRICKS, AND CEMENT
OF SUPERIOR QUALITY
FOR GAS-FURNACES.

Trade Mark: "SILICA."

These Goods (largely used in Gas, Glass, Iron, and Steel Works) are, on account of their
GREATER DURABILITY,
Strongly recommended where EXCESSIVE HEATS have to be maintained.

THOMAS TURTON
AND SONS, LIMITED,
SHEAF WORKS, SHEFFIELD,
MANUFACTURERS OF
FILES OF BEST QUALITY
FOR ENGINEERS.
STEEL OF ALL DESCRIPTIONS.
SCREW STOCKS, TAPS AND DIES,
SPANNERS, RATCHET BRACES, LIFTING JACKS,
ANVILS, VICES,
AND ENGINEERS' TOOLS GENERALLY.
LONDON OFFICE:
90, CANNON STREET, E.C.

BOLDON GAS COALS.

Worked by THE HARTON COAL CO., LTD.

Output about 3000 tons per day.

ANALYSIS—

Yield of Gas per ton .	10,500	Cubic Feet.
Illuminating Power . .	16·9	Candles.
Coke	66·7	Coke.
Sulphur	0·86	Sulphur.
Ash	2·04	Ash.

Boldon Gas Coals are supplied under contract to

The Gaslight and Coke Company, South Metropolitan Gas Company, Commercial Gas Company, Imperial Continental Gas Association, European Gas Company, L'Union des Gaz (the Continental Union Gas Company), Crystal Palace District Gas Company, Danish Gas Company, Bombay Gas Company, San Paulo Gas Company, Alliance and Dublin Consumers' Gas Company, Ipswich Gaslight Company, Newcastle Gas Company, Sunderland Gas Company, South Shields Gas Company, and to many other Companies at Home and Abroad.

For Prices, &c., apply to the

HARTON COAL COMPANY,
LIMITED,
Newcastle-on-Tyne.
W. H. PARKINSON,
FITTER.

LONDONDERRY GAS COALS
FROM THE
MARQUIS OF LONDONDERRY'S
COLLIERIES,
COUNTY OF DURHAM.

Available output up to 5000 tons per day.
Yield of Gas 11,000 cubic feet per ton of Coal as per analysis by
Mr. John Pattinson, F.C.S., F.I.S.

FOR PRICES AND PARTICULARS, APPLY TO

S. J. DITCHFIELD,
SEAHAM HARBOUR, COUNTY OF DURHAM.

THORNLEY GAS COALS
WORKED BY THE
WEARDALE IRON & COAL Co., Ld.
OUT OF THEIR
THORNLEY AND WHEATLEY HILL COLLIERIES.

Analysis made by
Messrs. J. & H. S. PATTINSON, *May 28, 1895,*

Yield of Gas per Ton . .	10,500 Cub. Ft.
Illuminating Power . .	16·9 Candles.
Coke (of good quality) . .	67·5 per Cent.
Sulphur	0·58 ,,
Ash	2·73 ,,

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QUAYSIDE, NEWCASTLE-ON-TYNE.

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TYNE
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Yield of Gas per ton	13,155 cub. ft.
Illuminating Power	38·22 candles.
Coke per ton	1,301·88 lbs.

EAST PONTOP
GAS COAL.

Yield of Gas per ton	10,500 cub. ft.
Illuminating Power	17·8 candles.
Coke	70 per cent.

SOUTH PELAW MAIN
GAS COAL.

Yield of Gas per ton	10,500 cub. ft.
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Coke	73·1 per cent.

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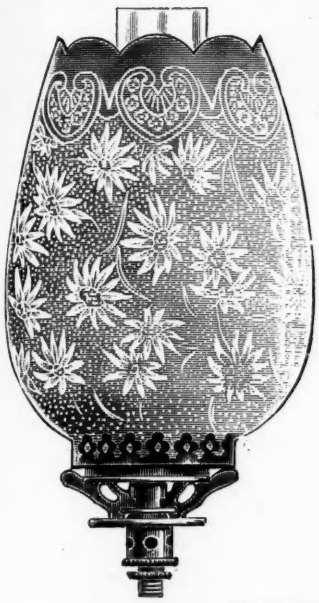

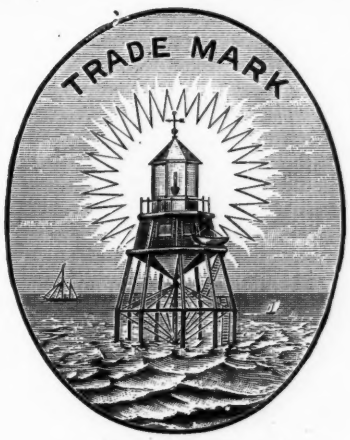

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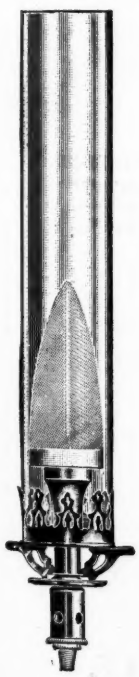

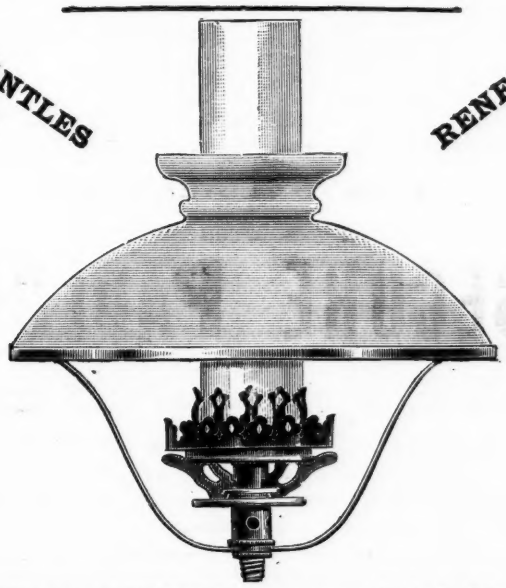

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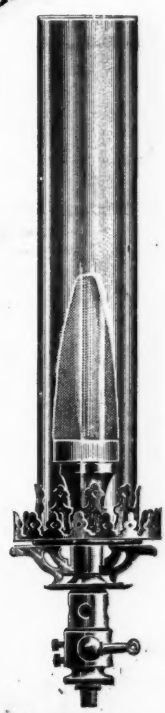

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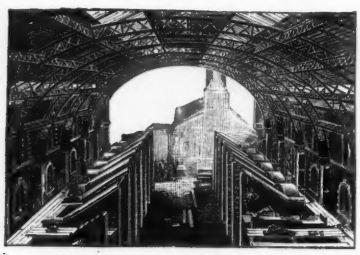

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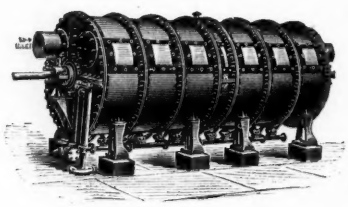

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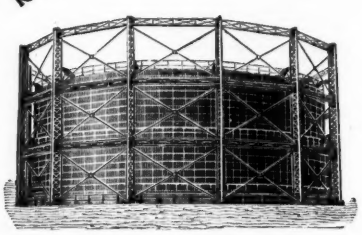

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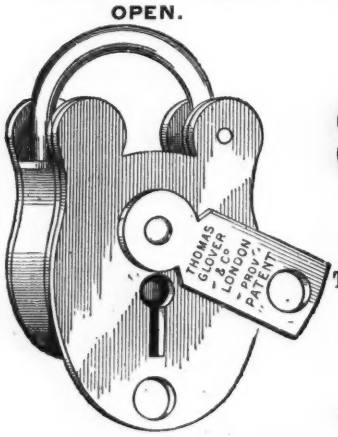

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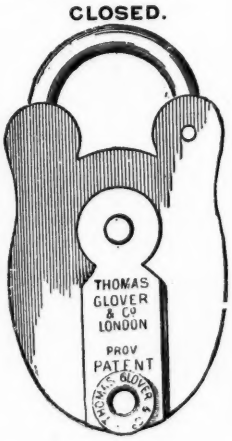

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At the following Gas-Works:—

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Belfast (Second Contract)	4,500,000 ,,	New York	1,200,000 ,,
Liverpool	3,500,000 ,,	Bath	1,000,000 ,,
Brighton	1,500,000 ,,	Southport	750,000 ,,
Tottenham	750,000 ,,	St. Joseph, Mo.	750,000 ,,
Tottenham (Second Contract)	750,000 ,,	Holyoke, Mass.	600,000 ,,
Swansea	750,000 ,,	Stockport	500,000 ,,
Copenhagen	700,000 ,,	Newburgh, N.Y.	350,000 ,,
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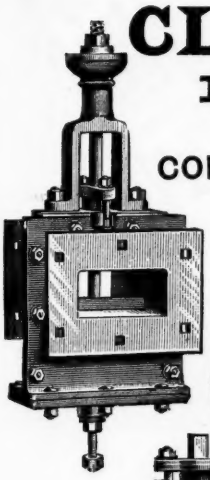

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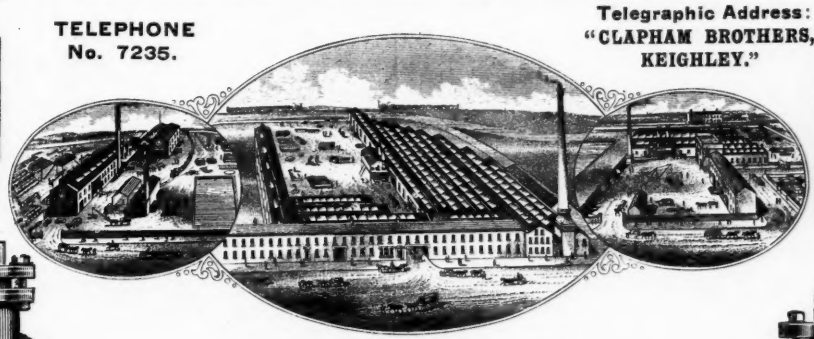
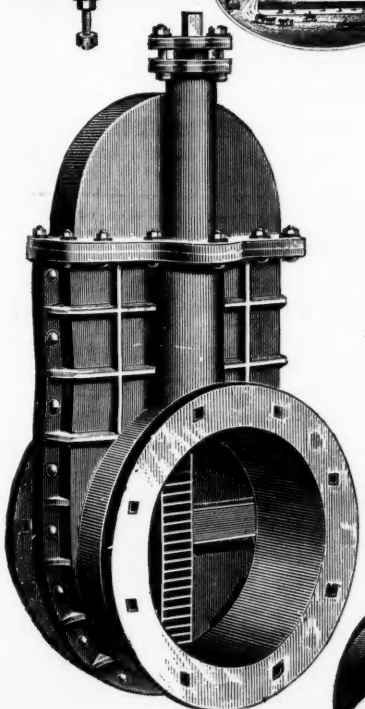
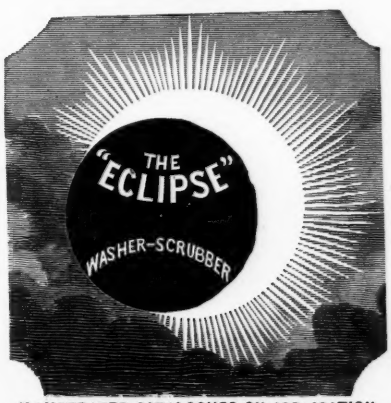
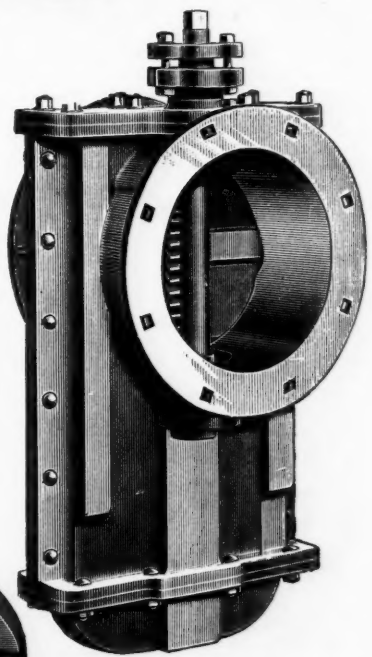
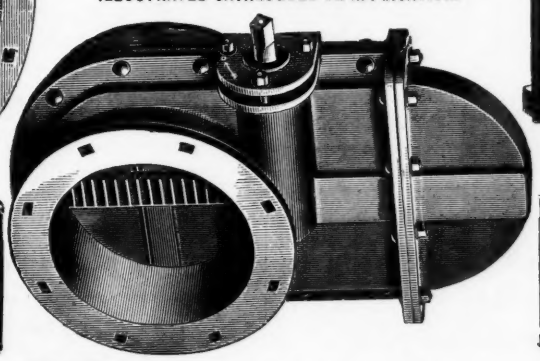






ILLUSTRATED CATALOGUES ON APPLICATION.





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[See Illustrated Advertisement, March 2, p. 496.]

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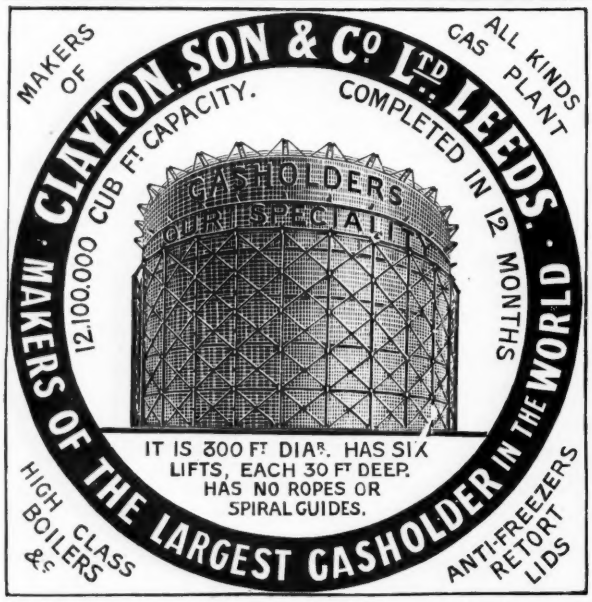
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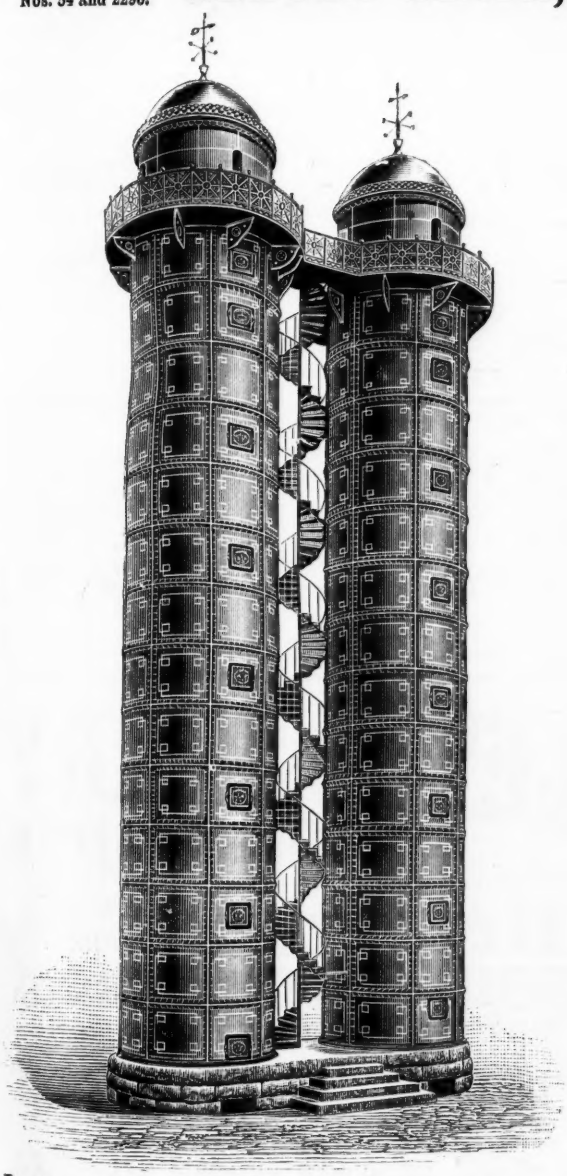

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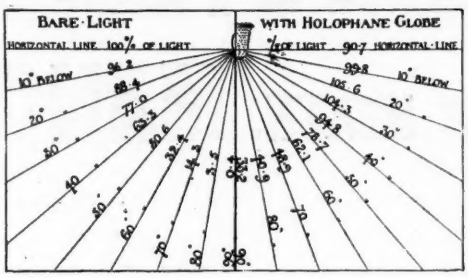

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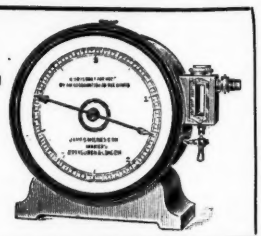

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